SLV-E130: AE1, AE2/E177EG/E180: EE, EG/E230: AE, CP, EY, UY, VP1, VP2/E285: B, VC/E295: CP, UX, VC1, VC2/E380: EE, EG/E430: AE, B, CP, VC, VP/E477EG/E480: EE, EG/E530: B, CP, UX, VC
RMT-V220/V220B/V221/V221A/V221B/V221C/V221D/V221E/V222/V222A/V222B

SERVICE MANUAL

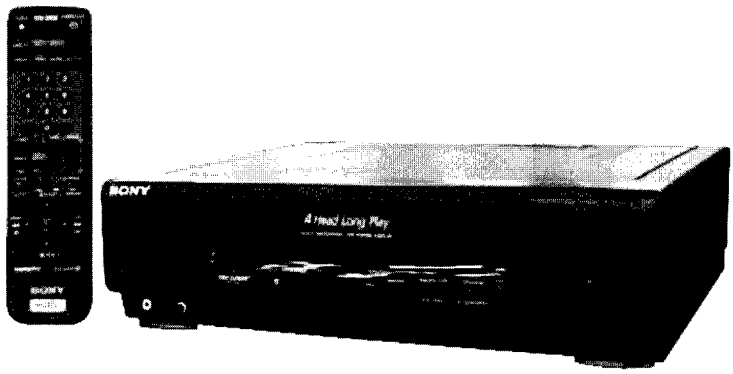

Photo: SLV-E530

S MECHANISM

VIDEOplus+

- **Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENTS VI for MECHANICAL ADJUSTMENTS. (9-921-647-11)**

AEP Model
SLV-E130AE1/E130AE2/E230AE/E430AE

French Model
SLV-E285B/E430B/E530B

Spanish Model
SLV-E230CP/E295CP/E430CP/E530CP

East European Model
SLV-E180EE/E380EE/E480EE

Middle European Model
SLV-E177EG/E180EG/E380EG/ E477EG/E480EG

Irish Model
SLV-E230EY

UK Model
SLV-E230UY/E295UX/E530UX

German Model
SLV-E230VP1/E230VP2/E285VC/E295VC1/ E295VC2/E430VC/E430VP/E530VC

* The abbreviations of E130, E177, E180, E230, E285, E295, E380, E430, E477, E480 and E530 contained in this service manual are indicated when these models are common to all their corresponding models as given below.

Abbreviated model name	E130	E177	E180	E230	E285	E295	E380	E430	E477	E480	E530
All model names SLV-	E130AE1 E130AE2	E177EG	E180EE E180EG	E230AE E230CP E230EY E230UY E230VP1 E230VP2	E285B E285VC	E295CP E295UX E295VC1 E295VC2	E380EE E380EG	E430AE E430B E430CP E430VC E430VP	E477EG	E480EE E480EG	E530B E530CP E530UX E530VC

VHS PAL NTSC4.43 VIDEO CASSETTE RECORDER

MICROFILM

SONY®

SPECIFICATIONS

System

Channel coverage

- SLV-E130/E230AE/E230CP/E230VP/E285VC/E295CP/E295VC/E430AE/E430CP/E430VC/E430VP/E530CP/E530VC:
  PAL (B/G)
  VHF E2 – E12
  (VHF Italian channel A to H)
  UHF E21 – E69
  CATV S01 – S05, S1 – S20
  HYPER S21 – S41
- SLV-E177/E180/E380/E477/E480:
  PAL (D/K, B/G)
  VHF R1 – R12, E2 – E12
  UHF R21 – R69, E21 – E69
  CATV S01 – S05, S1 – S20
  HYPER S21 – S41
- SLV-E230EY:
  PAL (I)
  VHF A-J
  UHF B21 – B69
  CATV S01 – S05, S1 – S20
  HYPER S21 – S41
- SLV-E230UY/E295UX/E530UX:
  PAL (I)
  UHF B21 – B69
- SLV-E285B/E430B/E530B:
  PAL (B/G)
  VHF E2 – E12
  (VHF Italian channel A to H)
  UHF E21 – E69
  CATV S01 – S05, S1 – S20
  HYPER S21 – S41
  SECAM (L)
  VHF F2 – F10
  UHF F21 – F69
  CATV B – Q
  HYPER S21 – S41

RF output signal
  UHF channels 21 – 69
Aerial out
  75-ohms asymmetrical aerial socket

Inputs/outputs

- SLV-E130/E177/E180EG/E230EY/E230UY/E380EG/E477/E480EG:
  ⇨ LINE-1 (TV)
    21-pin
    Video input: pin 20
    Audio input: pins 2 and 6
    Video output: pin 19
    Audio output: pins 1 and 3
- SLV-E180EE/E380EE/E480EE:
  LINE-1 IN
    VIDEO IN, phono jack (1)
    Input signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
    AUDIO IN, phono jack (1)
    Input level: 327 mVrms
    Input impedance: more than 47 kilohms
  LINE-2 IN (SLV-E380EE)
    VIDEO IN, phono jack (1)
    Input signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
    AUDIO IN, phono jack (1)
    Input level: 327 mVrms
    Input impedance: more than 47 kilohms
  LINE OUT
    VIDEO OUT, phono jack (1)
    Output signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
    AUDIO OUT, phono jack (1)
    Standard output: 327 mVrms
    Load impedance: 47 kilohms
    Output impedance: less than 10 kilohms
- SLV-E230AE/E230CP/E230VP/E285VC/E430AE/E430CP/E430VC/E430VP:
  ⇨ LINE-1 (TV)
    21-pin
    Video input: pin 20
    Audio input: pins 2 and 6
    Video output: pin 19
    Audio output: pins 1 and 3
  DECODER/⇦ LINE-2 IN (SLV-E230CP, E285VC, E430VC/CP)
  ⇨ LINE-2 (SLV-E430AE/VP)
    21-pin
    Video input: pin 20
    Audio input: pins 2 and 6
- SLV-E285B/E430B:
  ⇨ LINE-1 (TV)
    21-pin
    Video input: pin 20
    Audio input: pins 2 and 6
    Video output: pin 19
    Audio output: pins 1 and 3
  DECODER/⇦ LINE-2 IN
    21-pin
    Video input: pin 20
    Audio input: pins 2 and 6
- SLV-E295CP/E295VC/E530B/E530CP/E530VC:
  ⇨ LINE-1 (TV)
    21-pin
    Video input: pin 20
    Audio input: pins 2 and 6
    Video output: pin 19
    Audio output: pins 1 and 3
  DECODER/⇦ LINE-3 IN
    21-pin
    Video input: pin 20
    Audio input: pins 2 and 6
  LINE-2 IN
    VIDEO IN, phono jack (1)
    Input signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
    AUDIO IN, phono jack (1)
    Input level: 327 mVrms
    Input impedance: more than 47 kilohms
- SLV-E295UX/E530UX:
  ⇨ LINE-1 (TV)
    21-pin
    Video input: pin 20
    Audio input: pins 2 and 6
    Video output: pin 19
    Audio output: pins 1 and 3
  ⇦ LINE-3 IN
    21-pin
    Video input: pin 20
    Audio input: pins 2 and 6
  LINE-2 IN
    VIDEO IN, phono jack (1)
    Input signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
    AUDIO IN, phono jack (1)
    Input level: 327 mVrms
    Input impedance: more than 47 kilohms

General

Power requirements
  220 – 240 V AC, 50 Hz
Power consumption
  20W
Operating temperature
  5 °C to 40 °C
Storage temperature
  –20 °C to –60 °C
Dimensions
  Approx. 355 × 96 × 285 mm (w/h/d) including projecting parts and controls
Mass
  Approx. 3.9 kg

Supplied accessories

Remote commander (1)
R6 (size AA) batteries (2)
Aerial cable (1)

Design and specifications are subject to change without notice.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

- **Feature Difference**

SLV- / FEATURE	E130AE1/ E130AE2	E177EG/ E180EG	E180EE	E230AE/ E230VP1/ E230VP2	E230CP	E230EY/ E230UY
4 Head VIDEO						
LP REC						O
NTSC (REC/PB)		X/O	X/O			
SECAM (REC/PB)						
ME-SECAM (REC/PB)		O/O	O/O			
LINE1 RCA or EUR	EUR	EUR	RCA	EUR	EUR	EUR
FRONT IN						
EUR IN (2nd)						
C+ (2nd)					O (SW, C+)	
RF OUT SYSTEM	G	K/G	K/G	G	G	I
CLICK SHUTTLE						
REMOTE COMMANDER RMT-	V220	V220	V220	V221	V221	V221A

SLV- / FEATURE	E285B	E285VC	E295CP/ E295VC1/ E295VC2	E295UX	E380EE	E380EG
4 Head VIDEO						
LP REC			O	O		
NTSC (REC/PB)	X/O	X/O	X/O	X/O	X/O	X/O
SECAM (REC/PB)	O/O					
ME-SECAM (REC/PB)	X/O				O/O	O/O
LINE1 RCA or EUR	EUR	EUR	EUR	EUR	RCA	EUR
FRONT IN			O	O	O	
EUR IN (2nd)				O		
C+ (2nd)	O (SW, C+)	O (SW, C+)	O (SW, C+)			
RF OUT SYSTEM	L/G	G	G	I	K/G	K/G
CLICK SHUTTLE					O	O
REMOTE COMMANDER RMT-	V221B	V221	V222	V222A	V220	V221

SLV- / FEATURE	E430AE/ E430VP	E430B	E430CP/ E430VC	E477EG	E480EE	E480EG	E530B	E530CP/ E530VC	E530UX
4 Head VIDEO	O	O	O	O	O	O	O	O	O
LP REC	O	O	O	O	O	O	O	O	O
NTSC (REC/PB)	X/O	X/O	X/O	X/O	X/O	X/O	X/O	X/O	X/O
SECAM (REC/PB)		O/O					O/O		
ME-SECAM (REC/PB)		X/O		O/O	O/O	O/O	X/O		
LINE1 RCA or EUR	EUR	EUR	EUR	EUR	RCA	EUR	EUR	EUR	EUR
FRONT IN							O	O	O
EUR IN (2nd)	O								O
C+ (2nd)		O (SW, C+)	O (SW, C+)				O (SW, C+)	O (SW, C+)	
RF OUT SYSTEM	G	L/G	G	K/G	K/G	K/G	L/G	G	I
CLICK SHUTTLE							O (JOG)	O (JOG)	O (JOG)
REMOTE COMMANDER RMT-	V221E	V221C	V221E	V221D	V220B	V221E	V222B	V222	V222A

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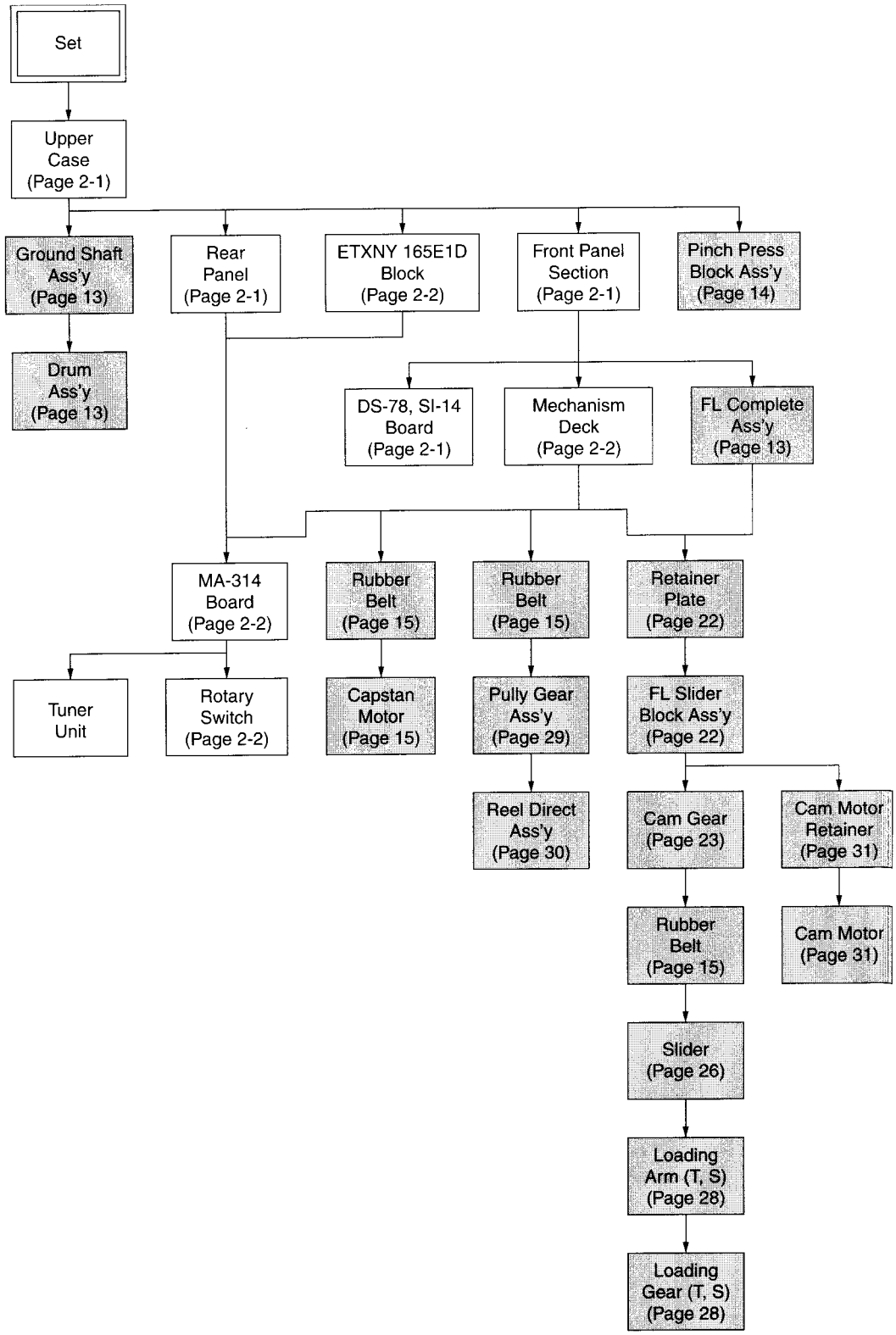
SERVICE NOTE

1. DISASSEMBLY

• This set can be disassembled in the order shown below.

Note: Pages in ▭ indicate pages in the SERVICE MANUAL.
Pages in ▭ indicate pages in the VHS MECHANICAL ADJUSTMENT MANUAL VI.


Set
Upper Case (Page 2-1)
Ground Shaft Ass'y (Page 13)
Rear Panel (Page 2-1)
ETXNY 165E1D Block (Page 2-2)
Front Panel Section (Page 2-1)
Pinch Press Block Ass'y (Page 14)
Drum Ass'y (Page 13)
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Cam Motor Retainer (Page 31)
Rubber Belt (Page 15)
Cam Motor (Page 31)
Slider (Page 26)
Loading Arm (T, S) (Page 28)
Loading Gear (T, S) (Page 28)

SECTION 1 GENERAL

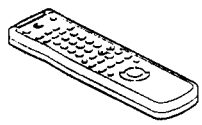
This section is extracted from SLV-E530UX, SLV-E295UX instruction manual.

Step 1

Unpacking

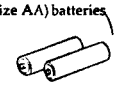
Check that you have received the following items with the VCR:

- Remote commander



- Aerial cable

- R6 (size AA) batteries



Checking your model name

The instructions in this manual are for the 2 models : SLV-E295UX, and E530UX. Check your model number by looking at the rear panel of your VCR. The SLV-E530UX is the model used for illustration purposes. Any difference in operation is clearly indicated in the text, for example, "SLV-E530UX only."

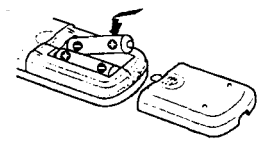
Step 2

Setting up the remote commander

Inserting the batteries

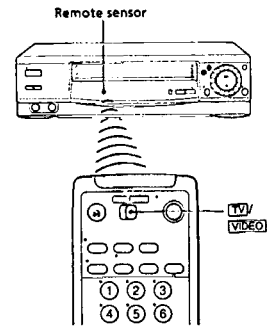
Insert two R6 (size AA) batteries by matching the + and – on the batteries to the diagram inside the battery compartment.

Insert the negative (–) end first, then push in and down until the positive (+) end clicks into the position.



Using the remote commander

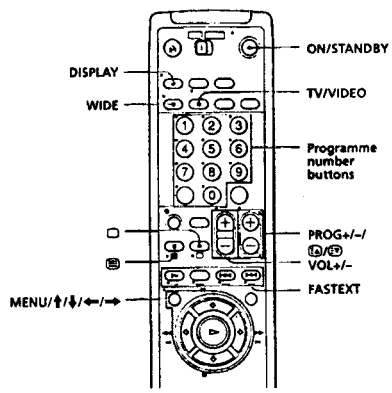
You can use this remote commander to operate this VCR and a Sony TV. Buttons on the remote commander marked with a dot (•) can be used to operate your Sony TV.



To operate	Set TV / VIDEO to
the VCR	VIDEO and point at the remote sensor on the VCR
a Sony TV	TV and point at the remote sensor on the TV

continued

Step 2 : Setting up the remote commander (continued)



TV control buttons

To	Press
Turn the TV into standby or active mode	ON/STANDBY
Select an input source of the TV either from aerial in or from line in	TV/VIDEO
Select the programme position of the TV	Programme number buttons PROG +/–
Adjust the volume of the TV	VOL +/–
Switch to TV (Teletext off)	▢ (TV)
Turn on the TV/switch to Teletext	▤ (Teletext)
Use FASTEXT	FASTEXT buttons
Call up on-screen display	DISPLAY
Change the Teletext page	⧉/⧉
Operate TV menu options	MENU/↑/↓/←/→
Switch the wide mode of a Sony wide TV	WIDE

Notes

- With normal use, the batteries should last about three to six months.
- If you do not use the remote commander for an extended period of time, remove the batteries to avoid possible damage from battery leakage.
- Do not use a new battery with an old one.
- Do not use different types of batteries.

Controlling other TVs with the remote commander

The remote commander is preprogrammed to control non-Sony TVs. If your TV is listed in the table below, set the appropriate manufacturer's code number.

1 Set TV / VIDEO at the top of the remote commander to TV.

2 Hold down ON/STANDBY, and enter your TV's code number(s) using the programme number buttons. Then release ON/STANDBY.
Now you can use the following TV control buttons to control your TV: ON/STANDBY, TV/VIDEO, programme number buttons, PROG +/–, VOL +/–, ▢ (TV), ▤ (Teletext), FASTEXT buttons, WIDE, MENU, ↑/↓/←/→ and OK with some TV.

Tip

- If you set your TV's code number correctly while the TV is turned on, the TV turns off automatically.

continued

Step 2 : Setting up the remote commander (continued)

Code numbers of controllable TVs

If more than one code number is listed, try entering them one at a time until you find the one that works with your TV.

To make wide mode settings, see the footnotes below this table for the applicable code numbers.

Manufacturer	Code number	Manufacturer	Code number
Sony	01*1, 02*	Philips	06*1, 07*1, 08*1
Akai	68	Saba	12, 13
Ferguson	52	Samsung	22, 23
Grundig	10*1, 11*1	Sanyo	25
Hitachi	27*1, 28*1, 50*1, 51*1	Sharp	29
Mitsubishi	09	TEAC	67
NEC	66	Telefunken	36
Nokia	15, 16, 69*3	Thomson	43*2
Panasonic	17*1, 49	Toshiba	38

*1 Press WIDE to switch the wide picture mode on or off.
*2 Press WIDE, then press VOL +/– to select the wide picture mode you want.
*3 Press WIDE. The menu appears on the TV screen. Then, press ↑/↓/←/→ to select the wide picture you want and press OK.

Notes

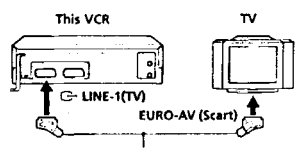
- If the TV uses a different remote control system from the one programmed to work with the VCR, you cannot control your TV with the remote commander.
- If you enter a new code number, the code number previously entered will be erased.
- When you replace the batteries of the remote commander, the code number automatically resets to 01 (Sony). Reset the appropriate code number.

Step 3 : Connecting the VCR (continued)

Additional connection

To a TV that has a EURO-AV (Scart) connector

This additional connection improves picture and sound quality. Connect the TV as shown on the right. Whenever you want to watch the VCR picture, press TV/VIDEO to display the VIDEO indicator in the display window.



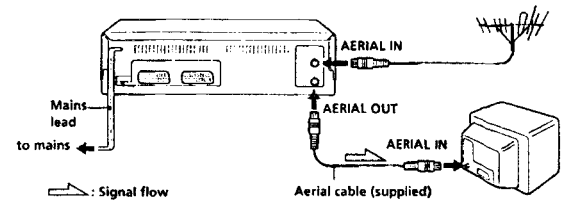
VMC-2121 EURO-AV cable (not supplied)

Note

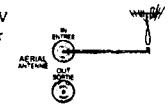
- When you connect the VCR and your TV only with an aerial cable, you have to set RF MODULATOR in the OPTIONS menu to ON (initial setting).
  If the TV is connected to the LINE-1(TV) connector, setting RF MODULATOR in the OPTIONS menu to OFF is recommended. In the OFF position, only the signal from the aerial is output through the AERIAL OUT connector (see page 52).

Step 3

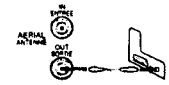
Connecting the VCR



1 Disconnect the aerial cable from your TV and connect it to AERIAL IN on the rear panel of the VCR.



2 Connect AERIAL OUT of the VCR and the aerial input of your TV using the supplied aerial cable.

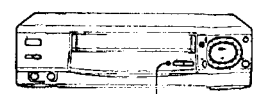


3 Connect the mains lead to the mains.

continued

Step 4

Setting up the VCR with the Auto Set Up function



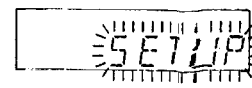
Before using the VCR for the first time, set up the VCR using the Auto Set Up function. With this function, you can set TV channels, guided by the sequence indicated in the display window.

Hold down AUTO SET UP on the VCR for more than three seconds.

The ATP (Auto Tuner Preset) function starts searching for all of the receivable channels and presets them with the guide channels for VIDEO Plus+ in the following order.

Station	Guide Channel
BBC1	1
BBC2	2
ITV	3
CH4	4
CH5	5

After the search is complete, the current time appears in the display window for any stations that transmit a time signal.



To cancel the Auto Set Up function

Press AUTO SET UP.

Tip

- If you want to change the language for the on-screen display from English, see page 19.

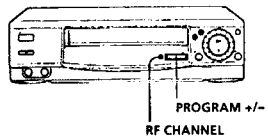
Note

- Do not cancel the Auto Set Up function during the ATP operations. If you do, repeat the step above.

Step 5

Tuning your TV to the VCR

If you connect the VCR to your TV using the EURO-AV cable, skip this step.

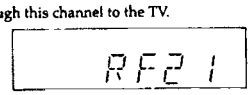


1 AUTO SET UP / RF CHANNEL

Press RF CHANNEL on the VCR.

The RF channel appears in the display window.

The VCR signal is output through this channel to the TV.



2

Turn on your TV and select a programme position for the VCR picture.

This programme position will now be referred to as the video channel.

3

Tune the TV to the same channel as that shown in the display window so that the picture on the right appears on the TV screen.

Refer to your TV manual for tuning instructions.

If the picture does not appear clearly, see "To obtain a clear picture from the VCR" on page 13.

4 AUTO SET UP / RF CHANNEL

Press RF CHANNEL.

You have now tuned your TV to the VCR. Whenever you want to play a tape, set the TV to the video channel.

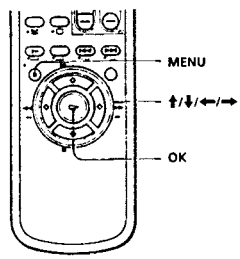
To check to see if the TV tuning is correct

Set the TV to the video channel and press PROGRAM +/– on the VCR. If the TV screen changes to a different programme each time you press PROGRAM +/–, the TV tuning is correct.

To obtain a clear picture from the VCR

If the picture does not appear clearly in step 3 above, go to step 4 to finish this procedure once. Then start from step 1. After pressing RF CHANNEL in step 1 to display the RF channel, press PROGRAM +/– so that another RF channel appears. Then tune the TV to the new RF channel until a clear picture appears.

Manual setup — Setting the clock



You must set the time and date on the VCR to use the timer recording features properly.

The Auto Clock Set function works only if a station in your area is broadcasting a time signal.

If the Auto Set Up function did not set the clock correctly for your local area, try another station for the Auto Clock Set function.

Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.

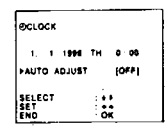
Setting the clock manually

1 MENU

Press MENU, then press ↑/↓ to select SETTINGS and press OK.

2

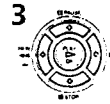
Press ↑/↓ to select CLOCK and press OK.

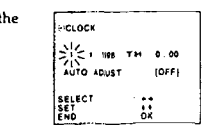


3

Press ↑/↓ to move the cursor (▶) to the clock row, then press →.

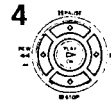
The day starts flashing.

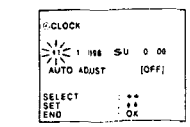




4

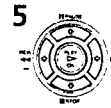
Press ↑/↓ to set the date.

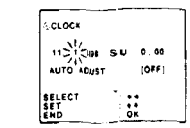




5

Press → to flash the month and set the month using ↑/↓.

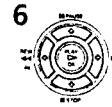


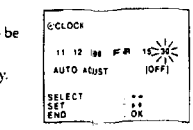


6

Set the year, hour, and minutes in sequence, using → to flash the item to be set, and press ↑/↓ to select the digits.

The day of the week is set automatically.

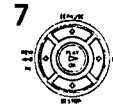


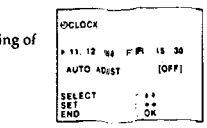


7

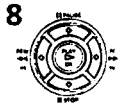
Press → to start the clock.

The cursor (▶) appears at the beginning of the line.





continued

8 

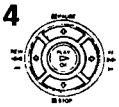
Press OK.

Tip

- To change the digits during setting, press ← to return to the item to be changed, and select the digits using ↑/↓.

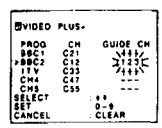
Note

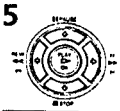
- The menu disappears automatically if you don't proceed for more than a few minutes.

4 

Press ↓ to move the cursor (▶) to CLOCK PROG, then press ←/→ repeatedly until the programme position of the station that carries the time signal appears.

If the VCR does not receive the time signal from any station, AUTO ADJUST returns to OFF automatically.



5 

Press OK.

Tip

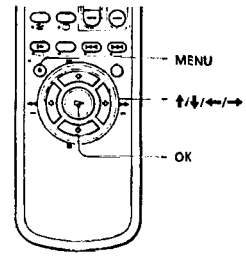
- If you set AUTO ADJUST to ON, the Auto Clock Set function is activated whenever the VCR is turned off. The date and time is adjusted automatically by making reference to the time signal from the station whose programme position is displayed in the "CLOCK PROG" row.

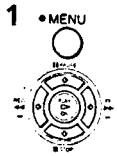
If you do not need the Auto Clock Set function, select OFF.

Note

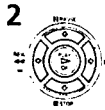
- The menu disappears automatically if you don't proceed for more than a few minutes.

Changing the station for the Auto Clock Set function

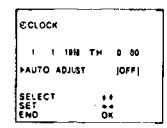


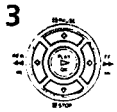
1 

Press MENU, then press ↑/↓ to select SETTINGS and press OK.

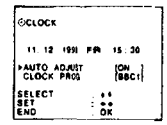
2 

Press ↑/↓ to select CLOCK and press OK.
The cursor (▶) is on AUTO ADJUST.



3 

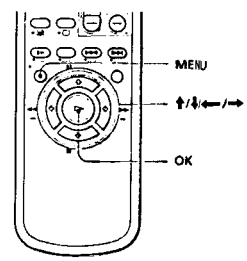
Press → to select ON.



continued

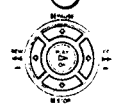
Manual setup — Selecting a language

You can change the on-screen display language.

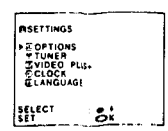


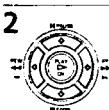
Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.

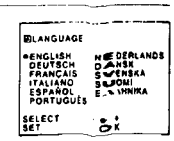
1 

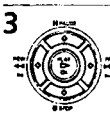
Press MENU, then press ↑/↓ to select SETTINGS and press OK.



2 

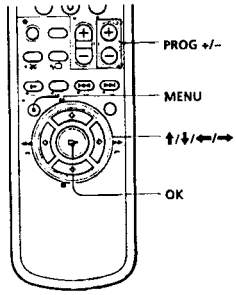
Press ↑/↓ to select LANGUAGE, then press OK.



3 

Press ↑/↓/←/→ to move the dot (●) to the desired language, then press OK.

Manual setup — Presetting channels

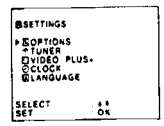


If some channels could not be preset using the Auto Set Up function, you can preset them manually.

Before you start...
- Turn on the VCR and the TV.
- Set the TV to the video channel.

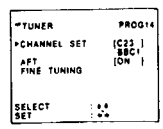
1 •MENU

Press MENU, then press ↑/↓ to select SETTINGS and press OK.



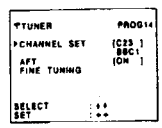
2

Press ↑/↓ to select TUNER, then press OK.



3

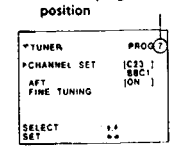
Press ↑/↓ to move the cursor (▶) to CHANNEL SET.



4 •PROG

Press PROG +/– to select the programme position.

Selected programme position

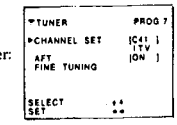


5

Press ←/→ repeatedly until the channel you want is displayed.

The channels appear in the following order:
- UHF B21 - B69

If you know the number of the channel you want, press the programme number buttons. For example, for channel 5, first press "0" and then press "5."



6

To allocate another channel to another programme position, repeat steps 4 and 5.

7

Press OK.

Manual setup — Presetting channels (continued)

Disabling unwanted programme positions

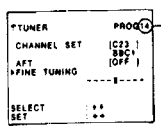
After presetting the channels, you can disable unused programme positions. The disabled positions will be skipped later when you press the PROG +/– buttons.

1. In step 5 above, press programme number button "0" twice to display the number "00" beside CHANNEL SET.
2. Press OK.

If the picture is not clear

Normally, the Auto Fine Tuning (AFT) function automatically tunes in channels clearly. If, however, the picture is not clear, you may also use the manual tuning function.

1. Press PROG +/– to select the programme position for which you cannot obtain a clear picture.
2. Press MENU, then select SETTINGS and press OK.
3. Select TUNER and press OK.
4. Select FINE TUNING. The fine tuning meter appears.



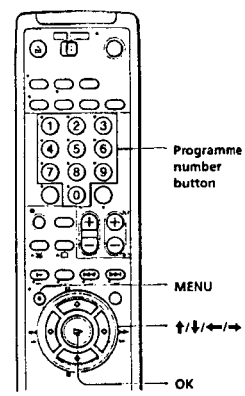
Selected programme position

5. Press ←/→ to get a clearer picture, then press OK.

Note that the AFT (Auto Fine Tuning) setting switches to OFF.

Note
- The menu disappears automatically if you don't proceed for more than a few minutes.

Manual setup — Setting up VIDEO Plus+



VIDEO Plus+ is a feature that simplifies programming the VCR to make timer recordings. To use VIDEO Plus+, each programme position needs to be matched with its VIDEO Plus+ guide channel. To get the guide channel numbers, see "Guide channels for VIDEO Plus+" on page 25, or look in the programme guide for your area that features PlusCode.
- If you want to record satellite broadcasts using VIDEO Plus+, see page 26.

Before you start...
- Turn on the VCR and the TV.
- Set the TV to the video channel.

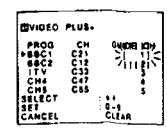
1 •MENU

Press MENU, then press ↑/↓ to select SETTINGS and press OK.

2

Press ↑/↓ to select VIDEO PLUS+ and press OK.

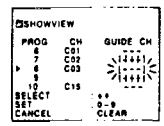
The preset channels are displayed on the screen. "- - -" in the GUIDE CH column means that the guide channel has not been preset.



continued

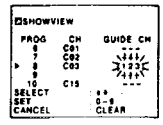
3 Press ↑/↓ to move the cursor (▶) to the row on which you want to set the guide channel.

To display other pages for programme positions 6 to 60, press ↑/↓ repeatedly.



4 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⓪

Press programme number buttons to enter the guide channel number assigned in the programme guide.



5 To set the guide channel of another station, repeat steps 3 to 4.

6 Press OK.

Guide channels for VIDEO Plus+

Guide channel	Station name
001	BBC1
002	BBC2
003	ITV
004	CHANNEL 4
005	CHANNEL 5
006	RTE 1
007	RTE 2
008	TV NA GAELTACHTA
101	SKY ONE
102	SKY NEWS
103	SKY MOVIES
104	THE MOVIE CHANNEL
105	SKY SPORT
106	NICKELODEON
	PARAMOUNT CHANNEL
107	EUROSPORT
	QUANTOM TV
108	WARNER BROTHERS
109	MTV EUROPE
110	CHILDREN'S CHANNEL
	THE FAMLY CHANNEL
111	THE DISNEY CHANNEL
112	BBC WORLD SERVICE
113	RTL 4
114	FILMNET 2
	SUPER SPORT
	ADULT CHAN
115	RTL PLUS INTERNATIONAL
116	SAT 1
117	PREMIERE
118	3 SAT
119	SKY 2
119	FOX KIDS
120	PRO 7
121	TELE 5
122	TELECLUB
123	UK GOLD
124	TLC
	DISCOVERY
	REGAL SHOP

Guide channel	Station name
125	BRAVO
	HSND
	EBN
126	CNN
127	EURONEWS
128	PERFORMANCE
	THE ARTS CHANNEL
129	SKY MOVIES GOLD
	WEATHER
130	UK LIVING
	TELEVISION X FANTASY CHANNEL
131	GRANADA +
132	GRANADA TALK
132	SKY SCOTTISH
133	TV5 EUROPE
134	TVE INTERNATIONAL
135	MBC
	ARABIC
136	QVC
137	SPORTNET
138	COUNTRY MUSIC TV
	JAPANESE TV
140	SKY SPORT 2 & SOAPS & TRAVEL & HIST & SF
141	TV ASIA
142	GRANADA GOOD LIFE
142	GRANADA TV HIGH STREET
142	GRANADA FOOD + WINE
142	GRANADA HEALTH AND BEAUTY
142	GRANADA HOME + GARDEN
143	LIVE TV
144	SUPERCHANNEL
145	VIDEO HITS ONE
	VH-1 (ENGLISH)
146	SELECT TV
147	FILMNET 1 (24 HOUR)
148	SKY SPORT 3
	PLAYBOY TV
149	TNT
	CARTOON NETWORK

Note

- The guide channel codes listed above are as of 20 February 1997. If you have any questions about the guide channels, please consult your nearest Sony service facility or the marketing group of Sony UK.

continued

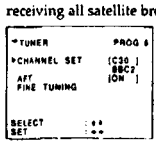
Setting up VIDEO Plus+ for satellite broadcasts

When your satellite tuner is connected via the AERIAL IN connector, first you have to set the programme position for each satellite channel using the TUNER menu. Then set the guide channel number for each satellite channel using the VIDEO Plus+ menu.

If your satellite tuner is connected via the LINE-1(TV) connector, you don't have to set programme positions nor guide channel numbers for satellite channels. Skip the following procedure.

1. Turn on the satellite tuner.
2. Press MENU, then select SETTINGS and press OK.
3. Select TUNER and press OK.
4. Press PROG +/– to select a programme position you want to use for watching a satellite channel.
5. Select CHANNEL SET, then press ←/→ repeatedly to tune the VCR to the satellite tuner.

   The channel number displayed beside CHANNEL SET is used for receiving all satellite broadcasts from the satellite tuner.



6. Press PROG +/– to select another programme position for the next satellite channel, and press the programme number buttons to enter the same channel number as the one displayed in step 5.

   Repeat this step for all satellite channels.
7. Set the guide channel number for each programme position assigned to the satellite channel, following the procedures on pages 23 and 24.

Notes

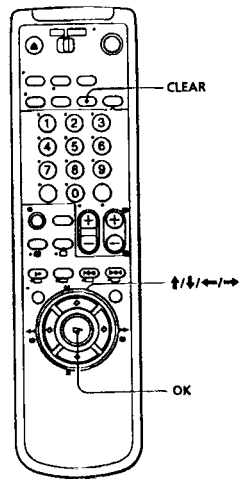
- The menu disappears automatically if you don't proceed for more than a few minutes.
- If you use a satellite tuner connected via the LINE-1 (TV) connector, you don't have to set up VIDEO Plus+. Just record a satellite programme using VIDEO Plus+, and the VCR automatically records the programme from the LINE-1 (TV) connector.
- If you inadvertently entered a guide channel number, press CLEAR.
- The VCR does not allow entering the guide channel number if the same number has been set.
- When you record a satellite broadcast using VIDEO Plus+, you need to select the desired channel on the satellite tuner manually.

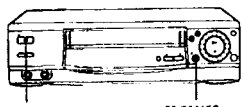
Setting your personal code

For identification, you can enter a personal code into the VCR. Once you enter your personal code, you can confirm it any time but can never change it.

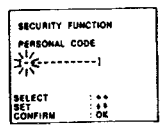
Before you start...

- Turn on the TV.
- Set the TV to the video channel.
- If there is a tape in the VCR, remove it.
- Turn off the VCR.

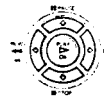




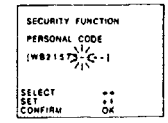
1 Hold down II PAUSE and ON/STANDBY on the VCR simultaneously for more than three seconds.



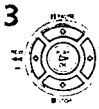
2 Enter your personal code.

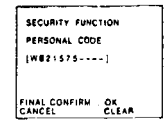


1 Press ↑/↓ to select a character.
Each time you press ↑, the character changes as shown below:
A → B → ... → Z → 0 → 1 → ... → 9 → (blank space) → - (hyphen) → A
2 Press → to set the next character.
The next space flashes.
To correct a character, press ←/→ until the character you want to correct flashes, then reset it.
You can set up to 11 characters for your personal code.

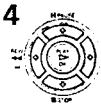


3 Press OK.
A confirmation screen appears.





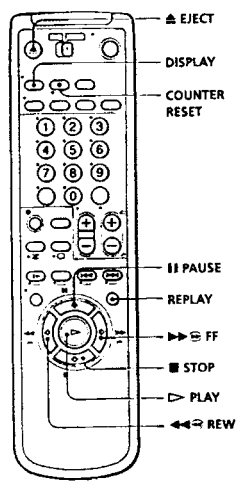
4 If the displayed personal code is correct, press OK.
If the displayed personal code is wrong, press CLEAR and continue from step 2.

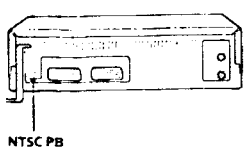


To confirm you personal ID

While the VCR is turned off and there is no tape in the VCR, hold down II PAUSE and ON/STANDBY on the VCR simultaneously for more than three seconds. The entered personal code appears on the TV screen. Press any button to enter normal viewing mode.

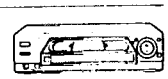
Playing a tape





1 Turn on your TV and set it to the video channel.

2 Insert a tape.
The VCR turns on and starts playing automatically if you insert a tape with its safety tab removed.



3 Press ▷ PLAY.
When the tape reaches the end, it will rewind automatically.

Additional tasks

To	Press
Stop play	■ STOP
Pause play	II PAUSE
Resume play after pause	II PAUSE or ▷ PLAY
Fast-forward the tape	▶▶ FF during stop
Rewind the tape	◀◀ REW during stop
Eject the tape	≙ EJECT

To replay a recently watched scene

You can immediately rewind and playback the scene you want to watch again.

During playback, press REPLAY up to four times. The VCR rewinds the tape about 10 seconds on the counter for each press of the button, and restarts playback.

To play an NTSC-recorded tape

Set NTSC PB at the rear of the VCR according to the colour system of your TV.

When your TV is	Set NTSC PB to
PAL only	ON PAL TV
PAL and NTSC	NTSC 4.43

To use the time counter

At the point on the tape that you want to find later, press COUNTER RESET. The counter in the display window resets to "0:00:00." Search for the point afterwards by referring to the counter.

To display the counter on the TV screen, press DISPLAY.

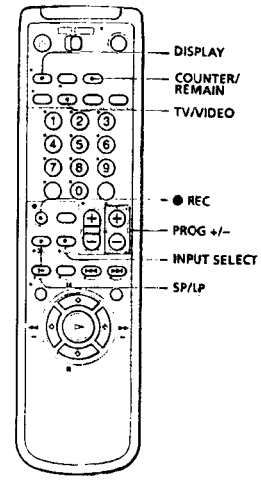
continued

Playing a tape (continued)

Notes

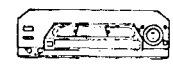
- The counter resets to "0:00:00" whenever a tape is reinserted.
- The counter stops counting when it comes to a portion with no recording.
- When you play back the tape recorded with the NTSC colour system, the counter does not appear on the TV screen.
- Depending on your TV, the following may occur while playing an NTSC-recorded tape:
  - The picture becomes black and white.
  - The picture shakes.
  - No picture appears on the TV screen.
  - Black streaks appear horizontally on the TV screen.
  - The colour density increases or decreases.
  - Deterioration of the picture quality may occur.
- If a tape has portions recorded in both PAL and NTSC systems, the time counter reading will not be correct. This is due to the difference between the counting cycles of the two video systems.
- While setting the menu on the TV screen, buttons for playback do not function.

Recording TV programmes



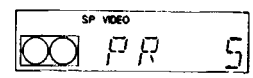
1 Turn on your TV and set it to the video channel.
To record from a decoder, turn it on.

2 Insert a tape with its safety tab in place.



3 INPUT SELECT

Press INPUT SELECT until a programme position number appears in the display window.

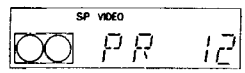


continued

Recording TV programmes (continued)

4 •PROG

Press PROG +/– to select the programme position you want to record.



5 SP/LP

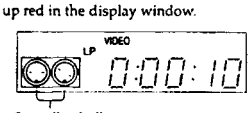
Press SP/LP to select the tape speed, SP or LP.

LP (Long Play) provides recording time twice as long as SP (Standard Play), however, SP produces better picture and audio quality.

6 ● REC

Press ● REC to start recording.

The recording indicator lights up red in the display window.



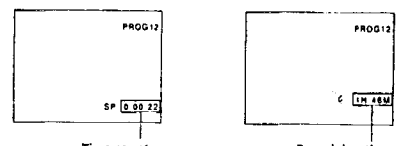
Recording indicator

To stop recording

Press ■ STOP.

To check the remaining time

Press DISPLAY. With the display on, press COUNTER/REMAIN to check the remaining time. Each time you press COUNTER/REMAIN the time counter and the remaining time appear alternately. The remaining time with the ⏲ indicator also appears in the display window.



Time counter — Remaining time

To correctly check the remaining time of the tape, set TAPE SELECT in the TAPE OPTIONS menu according to the tape type you use (see page 52).

To watch another TV programme while recording

1 Press TV/VIDEO to turn off the VIDEO indicator in the display window.
If the TV is connected to the VCR using only the aerial cable, skip this step.
2 Select another programme position on the TV.

To save a recording

To prevent accidental erasure, break off the safety tab as illustrated. To record on a tape again, cover the tab hole with adhesive tape.

Safety tab

continued

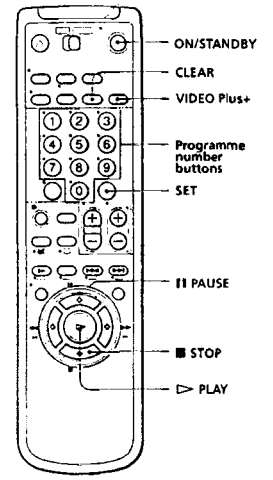
Tips

- To select a programme position, you can use the programme number buttons on the remote commander. For two-digit numbers, press the –/– – (ten's digit) button followed by the programme number buttons.
- You can select a video source from the LINE-1 (TV) or LINE-3 IN connector, or LINE-2 IN jacks using INPUT SELECT or PROG +/–. When you use PROG +/–, "L1," "L3" or "L2" appears in the display window between the lowest programme position and the highest one.
- The display appears on the TV screen indicating information about the tape, but the information won't be recorded on the tape.
- If you don't want to watch TV while recording, you can turn off the TV.

Notes

- The display does not appear during still (pause) mode or slow-motion playback.
- The display will not appear while playing an NTSC-recorded tape.
- If a tape has portions recorded in both PAL and NTSC systems, the time counter reading will not be correct. This discrepancy is due to the difference between the counting cycles of the two video systems.
- When you insert a non-standard commercially available tape, the remaining time may not be correct.
- The remaining time doesn't work for an NTSC-recorded tape. "–:––" appears in the display window.
- The remaining time is intended for rough measurement only.
- If you play back the tape for about 30 seconds after you have inserted it, the remaining time will be displayed.

Recording TV programmes using VIDEO Plus+



Just enter the programme's "PlusCode" listed in the TV programme guide. The date, times, and programme position of that programme are set automatically. You can preset up to eight programmes at a time.

Before you start...

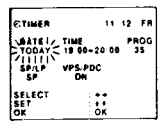
- Check that the VCR clock is set to the correct time.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.

1 VIDEO Plus+ Press VIDEO Plus+.

continued

2 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⓪ SET

Press the programme number buttons to enter the programme's PlusCode, then press SET.



If you make a mistake, press VIDEO Plus+ before pressing SET and re-enter the correct number.

The date, start and stop times, programme position, tape speed, and the VPS/PDC function setting appear on the TV screen.

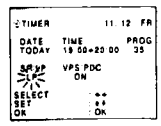
For details of the VPS/PDC function, see "Timer recording with VPS/PDC signals" on page 39.

If the information is incorrect, press CLEAR to cancel the setting.

3

If you want to change the date, tape speed, and the VPS/PDC function setting:

1 Press ⇐/⇒ to flash the item you want to change.
2 Press ↑/↓ to reset it.



- To record the same programme every day or the same day every week, see "Daily/weekly recording" on page 39.
- To record from other source connected to the LINE-1 (TV) or LINE-3 IN connector, or LINE-2 IN jacks, press INPUT SELECT to display "L1", "L3", or "L2" in the "PROG" position.

4

Press OK to complete the setting.

5

Press ON/STANDBY to turn off the VCR.

The ⏻ indicator appears in the display window and the VCR stands by for recording.

To stop recording

To stop the VCR while recording, press ■ STOP.

Daily/weekly recording

In step 3 above, press ↓ to select the recording pattern. Each time you press ↓, the indication changes as shown below. Press ↑ to change the indication in reverse order.

TODAY → SU-SA (Sunday to Saturday) → MO-SA (Monday to Saturday) → MO-FR (Monday to Friday) → SA (every Saturday) .....
→ MO (every Monday) → SU (every Sunday) → 1 month later → (dates count down) → TODAY

Timer recording with VPS/PDC signals

The broadcast systems transmit VPS (Video Programme System) or PDC (Programme Delivery Control) signals with their TV programmes. These signals ensure that your timer recordings are made regardless of broadcast delay, early starts or broadcast interruptions.

To use the VPS/PDC function, set VPS/PDC to ON. You can also use the VPS/PDC function for a source connected to the LINE-1(TV), LINE-3IN connectors, and LINE-2 IN jacks.

To record satellite broadcasts

If you connect the satellite tuner and the VCR, you can record satellite programmes.

1 Turn on the satellite tuner.
2 On the satellite tuner, select the satellite programme for which you want to make a timer setting.
3 Keep the satellite tuner turned on until the VCR finishes recording the satellite programme for which you have made a timer setting.

To use the VCR after setting the timer

To use the VCR before a timer recording begins, just press ON/STANDBY. The ⏻ indicator turns off and the VCR switches on. Remember to press ON/STANDBY to reset the VCR after using the VCR.

You can also do the following tasks while the VCR is recording:

- Reset the counter.
- Display tape information on the TV screen.
- Check the timer settings.
- Watch another TV programme.

continued

Recording TV programmes using VIDEO Plus+ (continued)

Tips

- To set the tape speed, you can also use the SP/LP button.
- When you are recording a progamme in the SP mode and the remaining tape becomes shorter than the recording time, the tape speed is automatically changed to the LP mode. Note that some interference will appear on the picture at the point the tape speed is changed. If you want to keep the same tape speed, set AUTO TAPE SPEED to OFF in the TAPE OPTIONS menu (page 52).

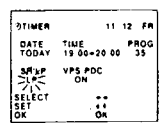
Note

- If the PlusCode is incorrect, the VIDEO Plus+ menu appears instead of the TIMER menu after pressing SET.

Setting the timer manually (continued)

2 Set the date, start and stop times, programme position, tape speed and VPS/PDC function:

1 Press ←/→ to flash each item in turn.
2 Press ↑/↓ to set each item.
To correct a setting, press ← to return to that setting and reset.



- To record the same programme every day or the same day every week, see "Daily/weekly recording" on page 43.
- To use the VPS/PDC function, see "Timer recording with VPS/PDC signals" on page 43.
- To record from other source connected to the LINE-1 (TV) or LINE-3 IN connector, or LINE-2 IN jacks, press INPUT SELECT to display "L1", "L3", or "L2" in the "PROG" position.

3 Press OK.

4 Press ON/STANDBY to turn off the VCR.

The ⏻ indicator appears in the display window and the VCR stands by for recording.

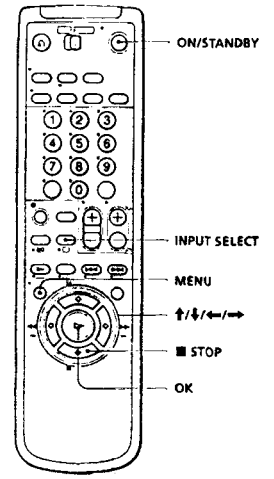
To record from a source, leave the connected equipment switched on.

To stop recording

To stop the VCR while recording, press ■ STOP.

To use the VCR after setting the timer

Setting the timer manually

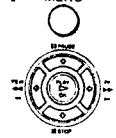


If VIDEO Plus+ is not available in you area, follow the instructions below to set the timer to record programmes.

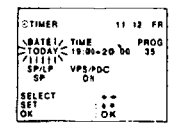
Before you start...

- Check that the VCR clock is set to the correct time.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
- Turn on your TV and set it to the video channel.
- To record from a decoder, turn it on.

1 • MENU



Press MENU, then press ↑/↓ to select TIMER and press OK.



continued

To use the VCR before a timer recording begins, just press ON/STANDBY. The ⏻ indicator turns off and the VCR switches on. Remember to press ON/STANDBY to reset the VCR after using the VCR.

You can also do the following tasks while the VCR is recording:

- Reset the counter.
- Display tape information on the TV screen.
- Check the timer settings.
- Watch another TV programme.

Daily/weekly recording

In step 2 above, press ↓ to select the recording pattern. Each time you press ↓, the indication changes as shown below. Press ↑ to change the indication in reverse order.

TODAY → SU-SA (Sunday to Saturday) → MO-SA (Monday to Saturday) → MO-FR (Monday to Friday) → SA (every Saturday) ..... → MO (every Monday) → SU (every Sunday) → 1 month later → (dates count down) → TODAY

Timer recording with VPS/PDC signals

The broadcast systems transmit VPS (Video Programme System) or PDC (Programme Delivery Control) signals with their TV programmes. These signals ensure that your timer recordings are made regardless of broadcast delay, early starts or broadcast interruptions.

To use the VPS/PDC function, set VPS/PDC to ON. You can also use the VPS/PDC function for a source connected to the LINE-1(TV), LINE-3 IN connectors, and LINE-2 IN jacks.

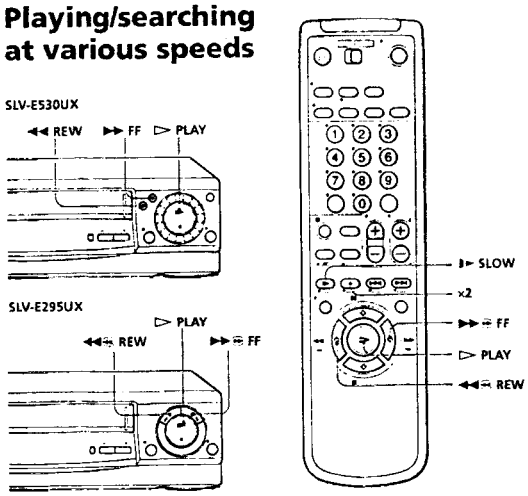
Tips

- To set the programme position, you can also use the PROG +/– or programme number buttons.
- To set the tape speed, you can also use the SP/LP button.
- When you are recording a progamme in the SP mode and the remaining tape becomes shorter than the recording time, the tape speed is automatically changed to the LP mode. Note that some interference will appear on the picture at the point the tape speed is changed. If you want to keep the same tape speed, set AUTO TAPE SPEED to OFF in the TAPE OPTIONS menu (page 52).

Notes

- When setting the timer with VPS/PDC signals, enter the start and stop times exactly as indicated in the TV programme guide, otherwise the VPS/PDC function won't work.
- If the VPS/PDC signal is too weak or the broadcasting station failed to transmit VPS/PDC signals, the VCR will start recording at the set time without using the VPS/PDC function.
- The ⏻ indicator flashes in the display window when you press ON/STANDBY with no tape inserted.

Playing/searching at various speeds

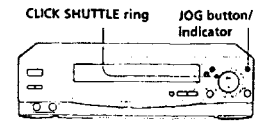


Playback options	Operation
View the picture during fast-forward or rewind	During fast-forward, hold down ▶▶ FF or ▶▶ FF. During rewind, hold down ◀◀ REW or ◀◀ REW.
Play at high speed	• During playback, press ▶▶ FF or ◀◀ REW. • During playback, hold down ▶▶ FF or ◀◀ REW. To resume normal playback, release the button.
Play at twice the normal speed	During playback, press ×2.
Play in slow motion	During playback or pause, press I▸ SLOW.
Play frame by frame	During pause, press ▶▶ FF or ◀◀ REW. Hold down the button to play one frame each second.
Rewind and start play	During stop, press ▷ PLAY on the VCR while holding down ◀◀ REW or ◀◀ REW on the VCR.

To resume normal playback

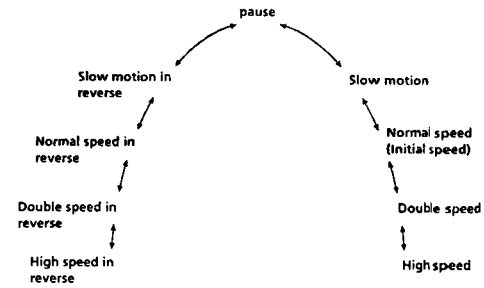
Press ▷ PLAY.

Using the CLICK SHUTTLE ring (SLV-E530UX only)



With the CLICK SHUTTLE ring, you can operate a variety of playback options.

During playback or pause, turn the CLICK SHUTTLE ring clockwise or counterclockwise. Each change in the CLICK SHUTTLE ring position changes the playback mode in the following way.



To use the CLICK SHUTTLE ring in jog mode

Use this mode for frame-by-frame play back.

Press JOG to enter the jog mode. The JOG button/indicator lights up. If you change to jog mode during any playback mode, playback pauses so you can see a still picture. Each change in the CLICK SHUTTLE ring position shifts the picture one frame. To shift frames in reverse, turn the CLICK SHUTTLE ring counterclockwise. The frame shift speed depends on the speed you turn the CLICK SHUTTLE ring. To cancel the jog mode, press JOG again. The JOG indicator goes off and the VCR enters the pause mode.

continued

Playing/searching at various speeds (continued)

Tip

- Adjust the picture using the TRACKING +/– buttons on the VCR if:
  - streaks appear while playing in slow motion
  - the picture shakes while pausing.

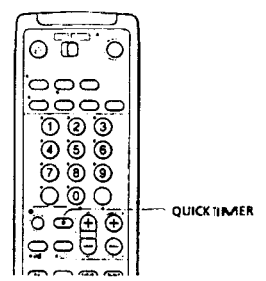
  To set tracking to the centre position, press both buttons (+/–) at the same time.

Notes

- The sound is muted during these operations.
- Tapes recorded in the LP mode on other VCRs can be played back on this VCR but the picture quality cannot be guaranteed.
- The picture may shake, be distorted or discoloured during the various playback operations.

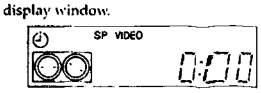
Recording TV programmes using the quick timer

After starting recording in the normal way, you can have the VCR stop recording automatically after a specified duration.



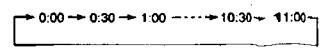
1 While recording, press QUICK TIMER once.

The ⏲ indicator appears in the display window.



2 Press QUICK TIMER repeatedly to set the duration.

Each press advances the time in increments of 30 minutes.



The duration decreases minute by minute to 0:00, then the VCR stops recording and turns off automatically.

To extend the duration

Press QUICK TIMER repeatedly to set to the new duration.

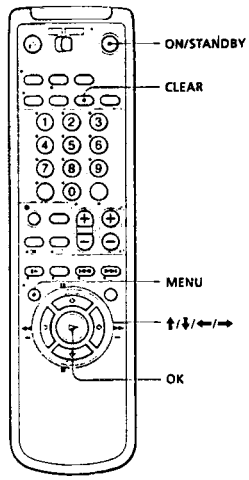
To stop recording

To stop the VCR while recording, press ■ STOP.

Using the quick timer during stop mode

You can set the quick timer and start recording during stop mode by pressing QUICK TIMER. To set the channel, you can use the PROG +/– or INPUT SELECT buttons. Press QUICK TIMER repeatedly to set the recording duration. The recording will start automatically.

Checking/ changing/ cancelling timer settings



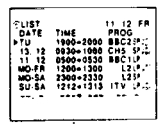
Before you start...

- Turn on your TV and set it to the video channel.

1 Press ON/STANDBY to turn on the VCR.

2 Press MENU, then press ↑/↓ to select LIST and press OK:

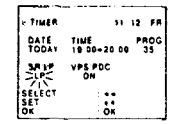
- If you want to change a setting, go on to the next step.
- If you do not need to change the settings, press OK, then turn off the VCR to return to recording standby.



3 Press ↑/↓ to select the setting you want to change or cancel, then press OK.

4 • To change the setting, press ←/→ to flash the item you want to change, and press ↑/↓ to reset it.

• To cancel the setting, press CLEAR.

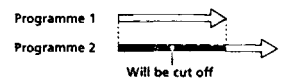


5 Press OK.

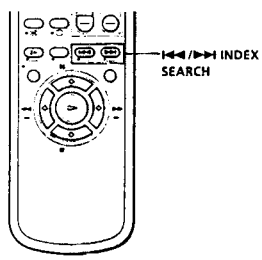
If any settings remain, turn off the VCR to return to recording standby.

When the timer settings overlap

The programme that starts first has priority and the second programme starts recording only after the first programme has finished. If the programmes start at the same time, the programme listed first in the menu has priority.



Searching using the index function



The VCR marks the tape with an index signal at the point where each recording begins. Use these signals as references to find a specific recording.

1 Insert an indexed tape into the VCR.

2 Press ⏮/⏭ INDEX SEARCH.

- To search ahead, press ⏭ INDEX SEARCH.
- To search backwards, press ⏮ INDEX SEARCH.

The VCR starts searching. Playback starts automatically from that point.

To stop searching

Press ■ STOP.

Note

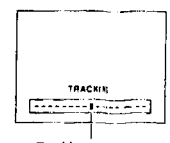
- No index signal will be added when recording starts from recording pause. However, an index signal will be marked if you change the programme position during recording pause.

Adjusting the picture

Adjusting the tracking

Although the VCR automatically adjusts the tracking when playing a tape (the ▩ indicator flashes in the display window, then goes off), distortion may occur if the tape was recorded in poor condition. If so, manually adjust the tracking.

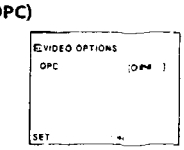
During playback, press the TRACKING +/− buttons on the VCR to display the tracking meter. The distortion should disappear as you press one of the two buttons. (The ▩ indicator lights up.) To resume automatic tracking adjustment eject the tape and restart it.



Tracking meter

About Optimum Picture Control (OPC)

Optimum Picture Control (OPC) automatically improves recording and playback quality by adjusting the VCR to the condition of the video heads and tape. To maintain better picture quality, we recommend that you set OPC to ON in the VIDEO OPTIONS menu (with the OPC indicator in the display window lit). For details, see page 52.



OPC playback

The OPC function automatically works on all types of tapes, including rental tapes and tapes that were not recorded with OPC.

OPC recording

Whenever you insert a tape and first start recording, the VCR adjusts to the tape using the OPC function (the OPC indicator flashes rapidly). This adjustment is retained until the tape is ejected.

To deactivate the OPC

Press MENU and select SETTINGS, OPTIONS, VIDEO OPTIONS then set OPC to OFF. The OPC indicator in the display window goes off.

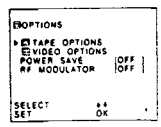
Note

- There is a delay of a few seconds before the VCR actually starts recording while the VCR analyses the tape. To avoid the delay, first set the VCR to recording pause (the OPC indicator flashes slowly) and press ● REC to have the VCR analyse the tape. After the OPC indicator stops flashing, press ❚❚ PAUSE to start recording immediately. If you press ❚❚ PAUSE before the OPC indicator stops flashing, the OPC function is cancelled.

Changing menu options

1 Press MENU, then press ↑/↓ to select SETTINGS and press OK.

2 Press ↑/↓ to select OPTIONS, then press OK.



3 Press ↑/↓ to select the option you want to change:

- To change the TAPE OPTIONS or VIDEO OPTIONS
  1 Press OK after selecting TAPE OPTIONS or VIDEO OPTIONS.
  2 Press ↑/↓ to select the option, then press ←/→ to change the setting.
- To change the other options
  Press ←/→ to change the setting.

4 Press OK to return to the original screen.

Menu choices

Initial settings are indicated in bold print.

TAPE OPTIONS

Menu option	Set this option to
AUTO TAPE SPEED	• **ON** to change the timer recording tape speed automatically to the LP mode when the remaining tape becomes shorter than the recording time. • **OFF** to keep the set tape speed.
TAPE SELECT	• **300** to use an E-300 type tape. • **240** to use an E-240 type tape. • **195** to use an E-195 or shorter type tape.

VIDEO OPTIONS

Menu option	Set this option to
OPC	• **ON** to switch on the OPC (Optimum Picture Control) function and improve picture quality. • OFF to switch off OPC.

Other options

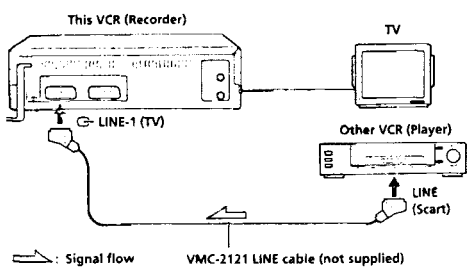
Menu option	Set this option to
POWER SAVE	• **OFF** to turn on the indicators in the display window while the VCR is standing by. • ON to turn off the indicators in the display window to conserve the VCR power.
RF MODULATOR	• **ON** if you connect the VCR to your TV using only the aerial cable. • OFF if you connect the VCR to your TV using the EURO-AV cable.

Note

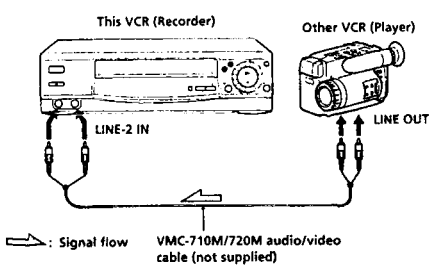
- When you set a timer recording, the indicators in the display window are on even though POWER SAVE is set to ON.

Editing with another VCR

Connecting to record on this VCR



You can connect to the jacks on the front panel.

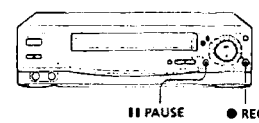


Notes

- Make sure you connect the plugs to jacks of the same colour.
- If you connect this VCR to both the LINE IN and LINE OUT jacks of the other VCR, select the input correctly to prevent a humming noise.

Operation (when recording on this VCR)

Before you start editing



- Turn on your TV and set it to the video channel.
- Press INPUT SELECT to display "L1" (or "L2" or "L3") in the display window.
- Press SP/LP to select the tape speed, SP or LP.

1 Insert a source tape with its safety tab removed into the other (playback) VCR. Search for the point to start playback and set it to playback pause.

2 Insert a tape with its safety tab in place into this (recording) VCR. Search for the point to start recording and press II PAUSE.

3 Press ● REC on this VCR and set it to recording pause.

4 To start editing, press the II PAUSE buttons on both VCRs at the same time.

To stop editing

Press the ■ STOP buttons on both VCRs.

Tips

- To edit more precisely, press the II PAUSE buttons on the VCRs to release pause.
- To cut out unwanted scenes while editing, press II PAUSE on this VCR when an unwanted scene begins. When it ends, press II PAUSE again to resume recording (Assemble Editing).

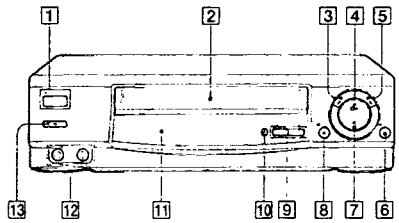
Note

- If you start recording following the procedure above, the VCR won't start recording with the OPC function. To record a tape with the OPC function, press ● REC again during recording pause in step 3 so that the VCR analyses the tape. Then, when you start editing in step 4, press II PAUSE after the OPC indicator stops flashing. If you press II PAUSE before the OPC indicator stops flashing, the OPC function is cancelled.

Index to parts and controls

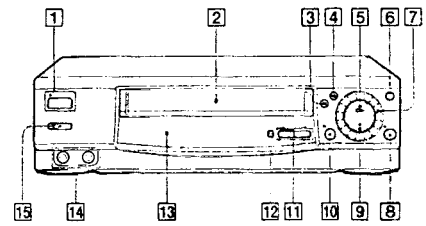
Refer to the pages indicated in parentheses ( ) for details.

Front panel (SLV-E295UX)



1 ON/STANDBY switch/indicator (38)
2 Tape compartment
3 ◄◄ REW (rewind) button (31, 44)
4 ▷ PLAY button (30)
5 ►► FF (fast-forward) button (31, 44)
6 ● REC (record) button (34)
7 ■ STOP button (34)
8 ❚❚ PAUSE button (31)
9 PROGRAM/TRACKING +/− buttons (34, 51)
10 AUTO SET UP/RF (Radio Frequency) CHANNEL button (11, 13)
11 Remote sensor (5)
12 LINE-2 IN VIDEO/AUDIO jacks (54)
13 ▲ EJECT button (31)

Front panel (SLV-E530UX)

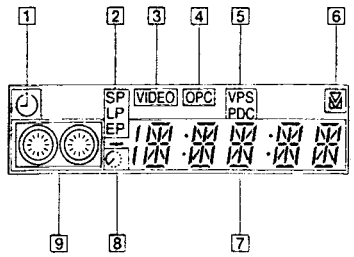


1 ON/STANDBY switch/indicator (38)
2 Tape compartment
3 ◄◄ REW (rewind) button (31, 44)
4 ►► FF (fast-forward) button (31, 44)
5 ▷ PLAY button (30)
6 JOG button/indicator (45)
7 CLICK SHUTTLE ring (45)
8 ● REC (record) button (34)
9 ■ STOP button (34)
10 ❚❚ PAUSE button (31)
11 PROGRAM/TRACKING +/− buttons (34, 51)
12 AUTO SET UP/RF (Radio Frequency) CHANNEL button (11, 13)
13 Remote sensor (5)
14 LINE-2 IN VIDEO/AUDIO jacks (54)
15 ▲ EJECT button (31)

continued

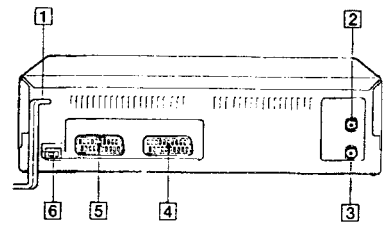
Index to parts and controls (continued)

Display window



1 Timer indicator (38)
2 Tape speed indicators (34)
3 VIDEO indicator (35)
4 OPC (Optimum Picture Control) indicator (51)
5 VPS/PDC (Video Programme System/Programme Delivery Control) indicator (39, 43)
6 Tracking indicator (51)
7 Time counter/clock/line/programme position indicator (31, 34, 55)
8 Remaining time indicator (35)
9 Tape/recording indicator (34)

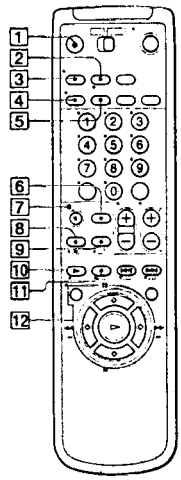
Rear panel



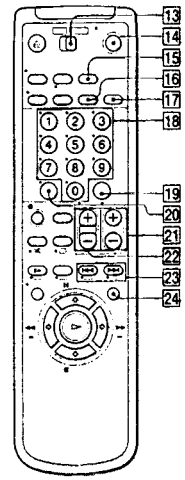
1 Mains lead (9)
2 AERIAL IN ANTENNE ENTREE connector (9)
3 AERIAL OUT ANTENNE SORTIE connector (9)
4 ⊣ LINE-3 IN ⊣ ENTREE LIGNE-3 connector
5 ⊢ LINE-1 (TV) ⊢ LIGNE-1 (TV) connector (10, 54)
6 NTSC PB (PlayBack) switch (31)

continued

Remote commander



1 ⏏ EJECT button (31)
2 COUNTER RESET button (31)
3 DISPLAY button (31)
4 WIDE button *(for TV)* (6)
5 TV/VIDEO button (35)
6 QUICK TIMER button (47)
7 ● REC (record) button (34)
8 SP (Standard Play)/LP (Long Play) button (34)
▤ (Teletext) button *(for TV)* (6)
9 INPUT SELECT button (33, 42)
▢ TV power on/TV mode select button *(for TV)* (6)
10 ▮▶ SLOW button* (44)
11 ×2 button* (44)
12 Tape/menu operatin buttons
MENU button (14, 52)
❚❚ PAUSE/↑ button (31)
■ STOP/↓ button (34)
◀◀ REW (rewind)/← button (31, 44)
▶▶ FF (fast-forward)/→ button (31, 44)
▷ PLAY/OK button (30)

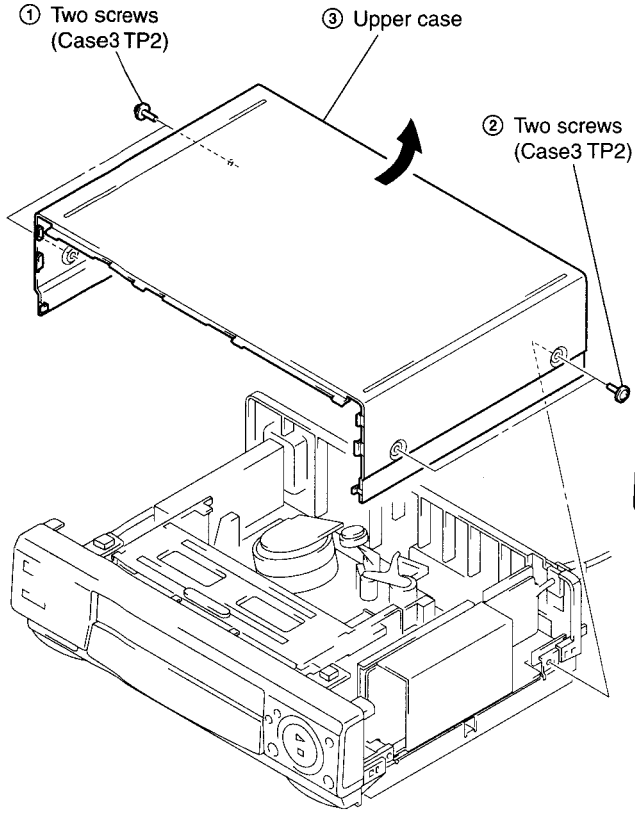


13 TV/VIDEO remote control switch (5)
14 ON/STANDBY switch (38)
15 COUNTER/REMAIN button (35)
16 CLEAR button (49)
17 VIDEO Plus+ button (37)
18 Programme number buttons (24, 38)
19 SET button (38)
20 -/-- (ten's digit) button (36)
21 PROG (programme) +/– buttons (34)
▤/▤ Teletext page access buttons *(for TV)* (6)
22 VOL (volume) +/– buttons *(for TV)* (6)
23 ⏮/⏭ INDEX SEARCH buttons* (50)
24 REPLAY button (31)
* FASTEXT buttons *(for TV)*

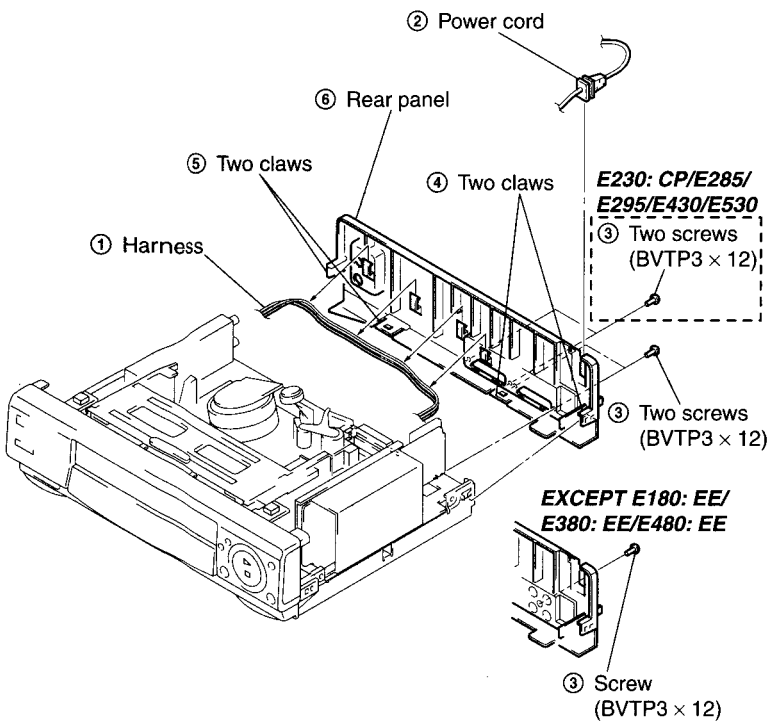
SECTION 2
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

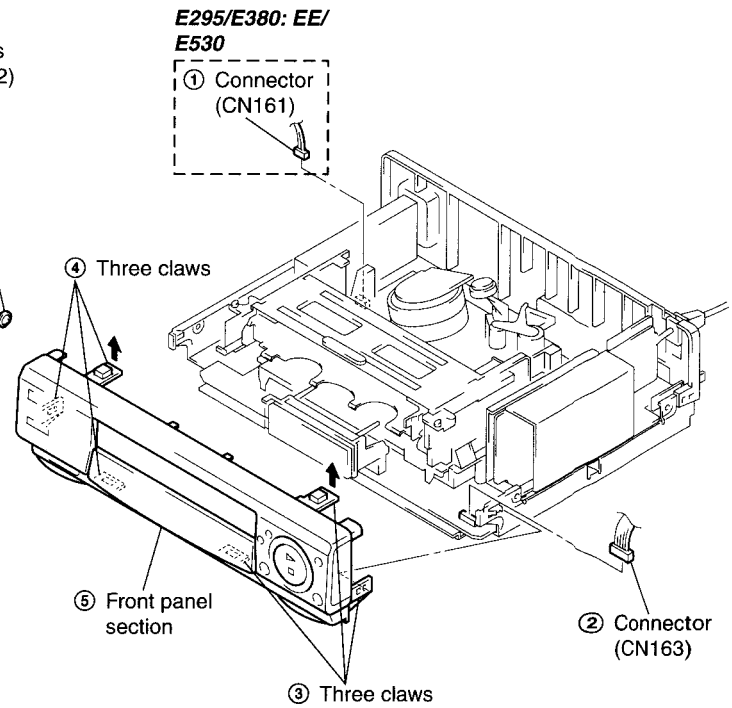
2-1. UPPER CASE REMOVAL



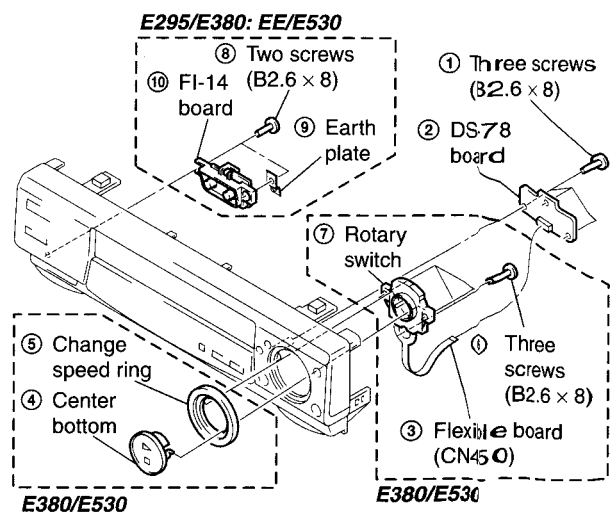
2-2. REAR PANEL REMOVAL



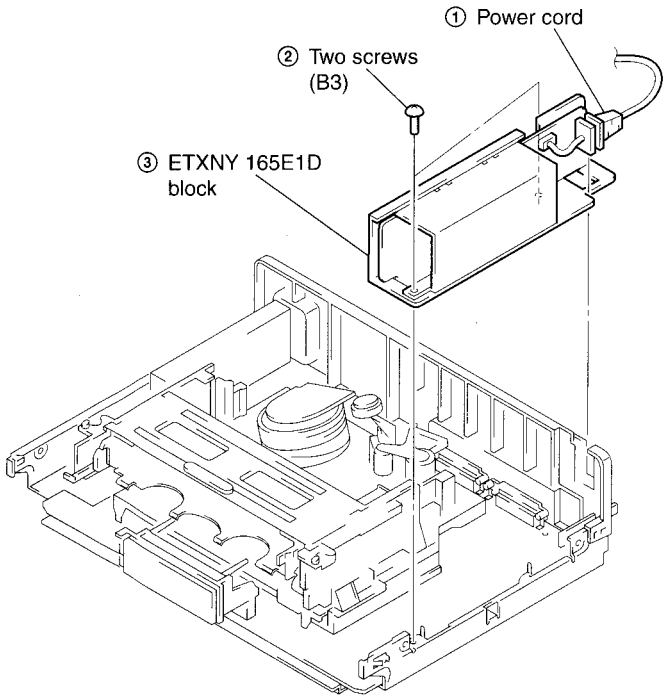
2-3. FRONT PANEL SECTION REMOVAL



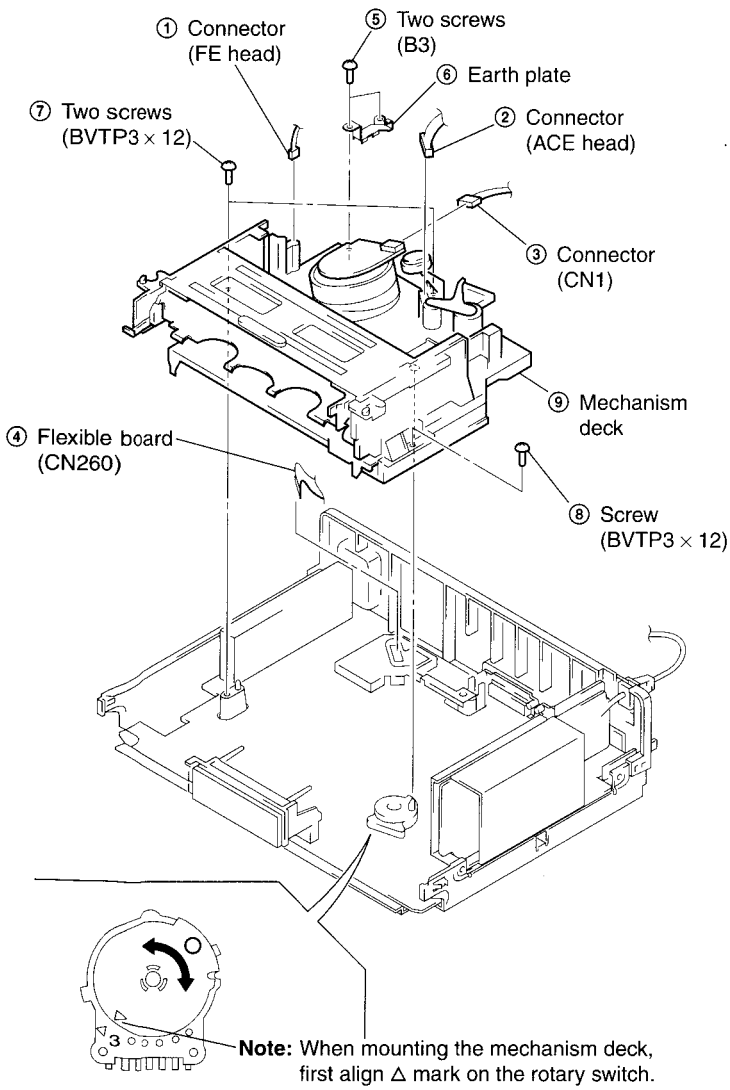
2-4. DS-78, FI-14 BOARD REMOVAL



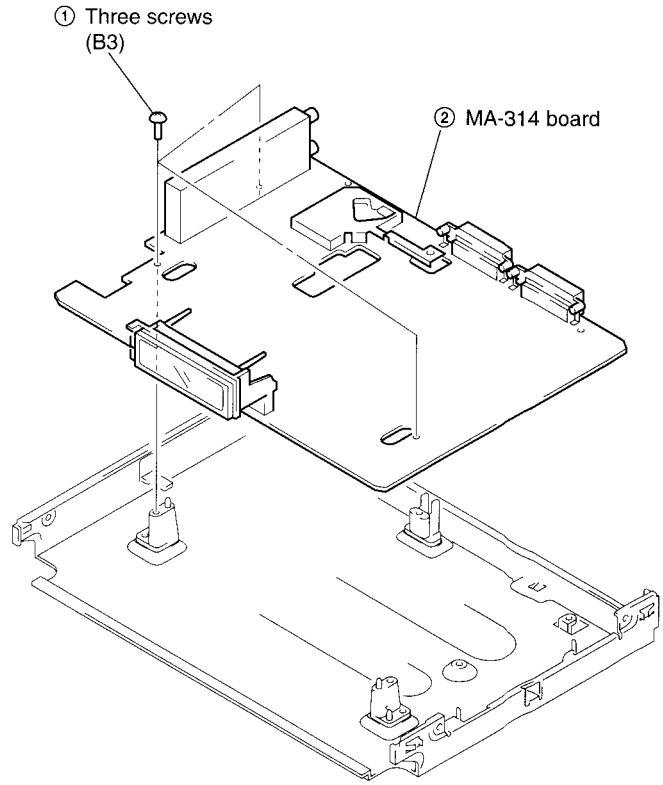
2-5. ETXNY 165E1D BLOCK REMOVAL



2-6. MECHANISM DECK REMOVAL


① Connector (FE head)
⑤ Two screws (B3)
⑥ Earth plate
⑦ Two screws (BVTP3 × 12)
② Connector (ACE head)
③ Connector (CN1)
⑨ Mechanism deck
④ Flexible board (CN260)
⑧ Screw (BVTP3 × 12)
3
Note: When mounting the mechanism deck, first align △ mark on the rotary switch.

2-7. MA-314 BOARD REMOVAL



2-8. INTERNAL VIEWS

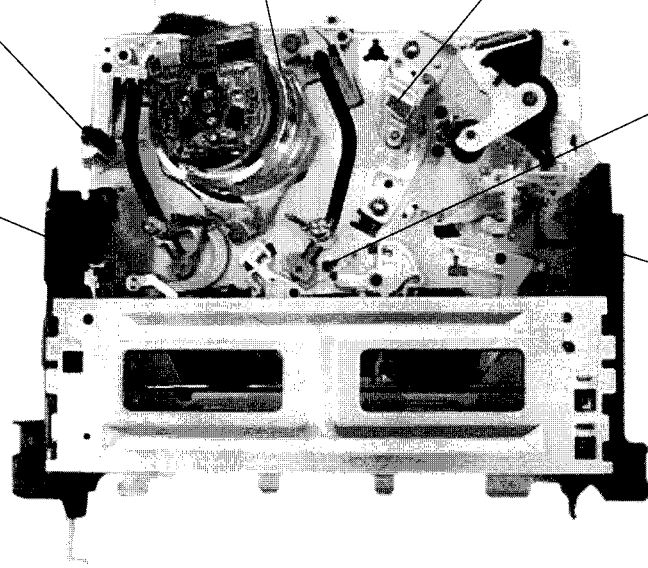
Drum assembly (M901) (DZH-78A-R)
1-759-183-11 (E130/E177/E180/E230: AE, CP, VP2/E285: B/E380)
Drum assembly (M901) (DZH-93A-R)
1-759-522-11 (E430/E477/E480/E530)
Drum assembly (M901) (DZH-92A-R)
1-759-523-11 (E230: EY, UY, VP1/E285: VC/E295)

ACE head assembly
A-6759-620-A

FE head
1-500-144-11

D102
Tape top/end LED
8-719-048-26

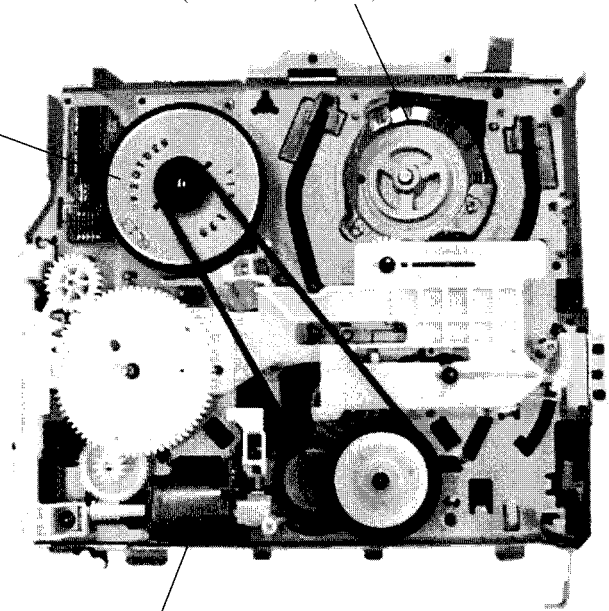
Q100
Tape top sensor
8-729-043-84



Q101
Tape end sensor
8-729-043-84

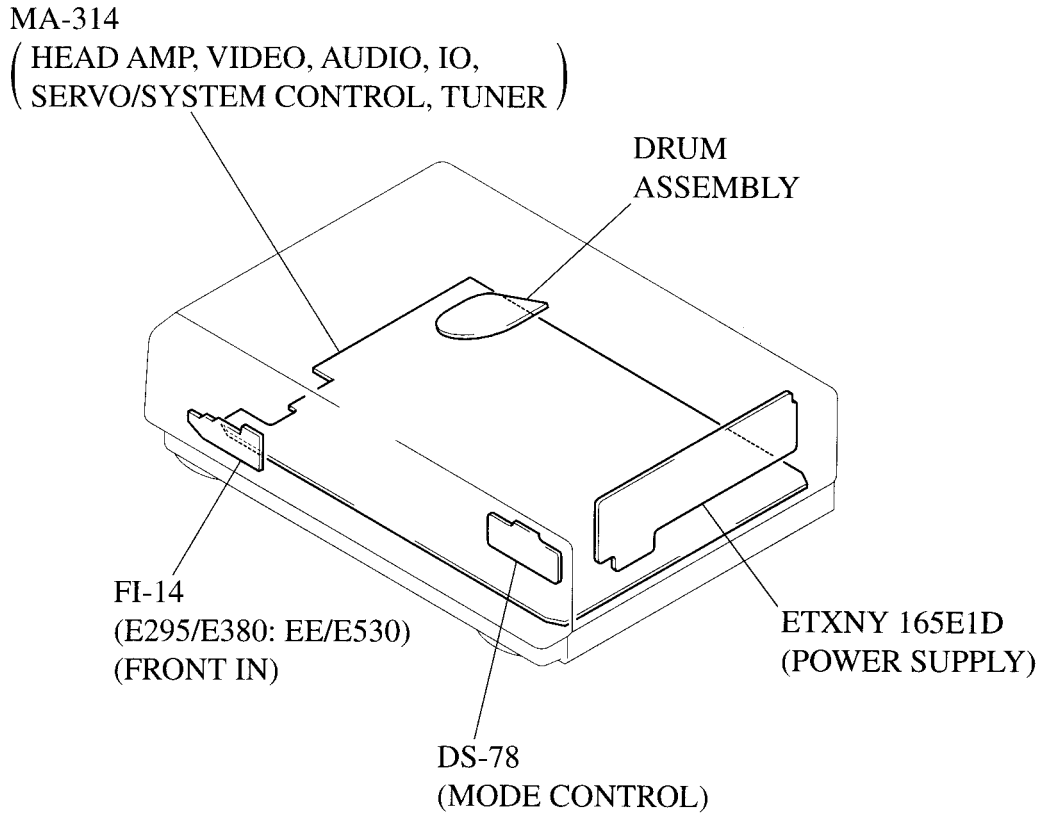
Drum assembly (M901) (DZH-78A-R)
1-759-183-11 (E130/E177/E180/E230: AE, CP, VP2/E285: B/E380)
Drum assembly (M901) (DZH-93A-R)
1-759-522-11 (E430/E477/E480/E530)
Drum assembly (M901) (DZH-92A-R)
1-759-523-11 (E230: EY, UY, VP1/E285: VC/E295)

Capstan motor
1-698-971-11



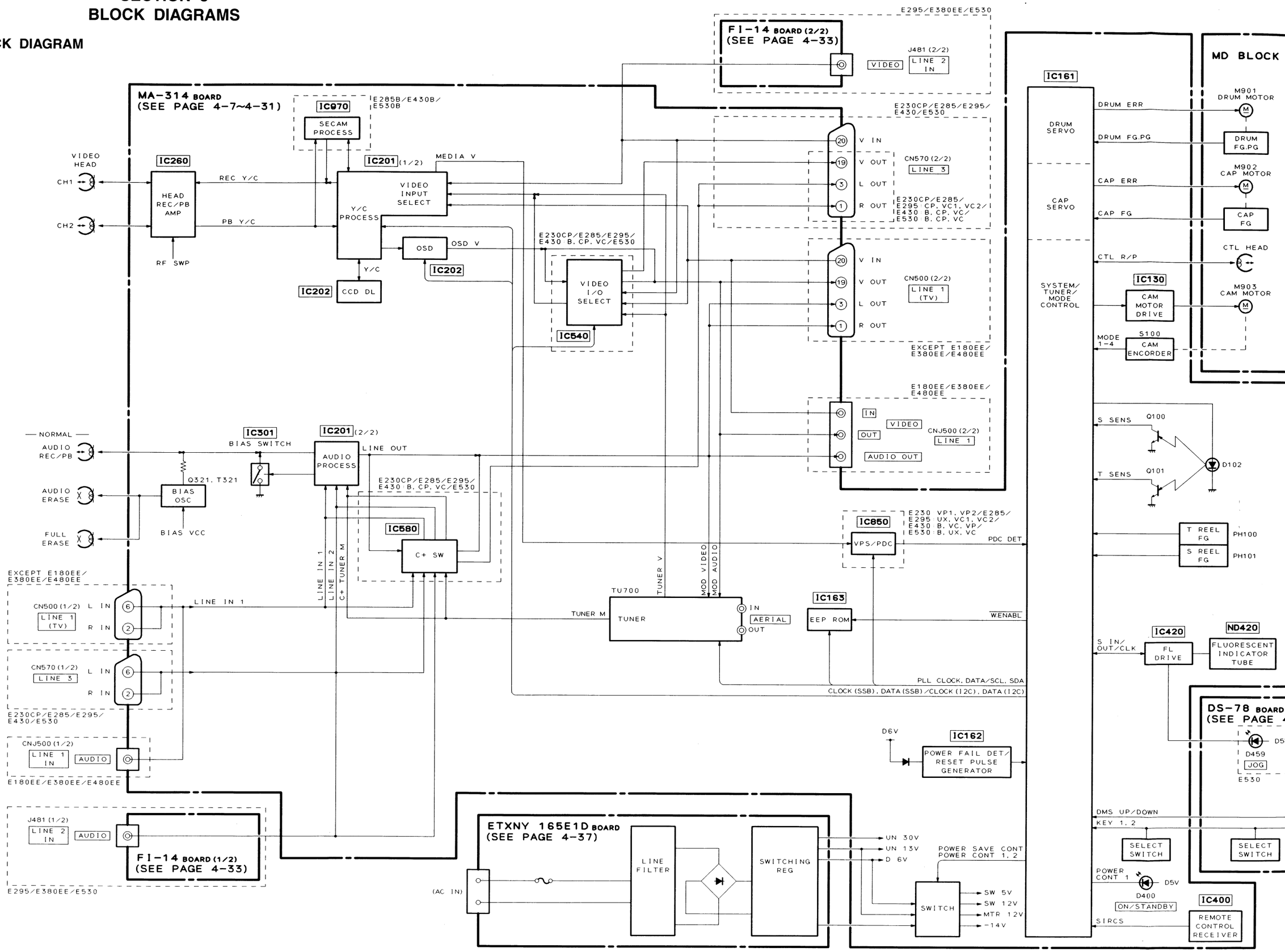
Cam motor assembly
X-3947-577-1

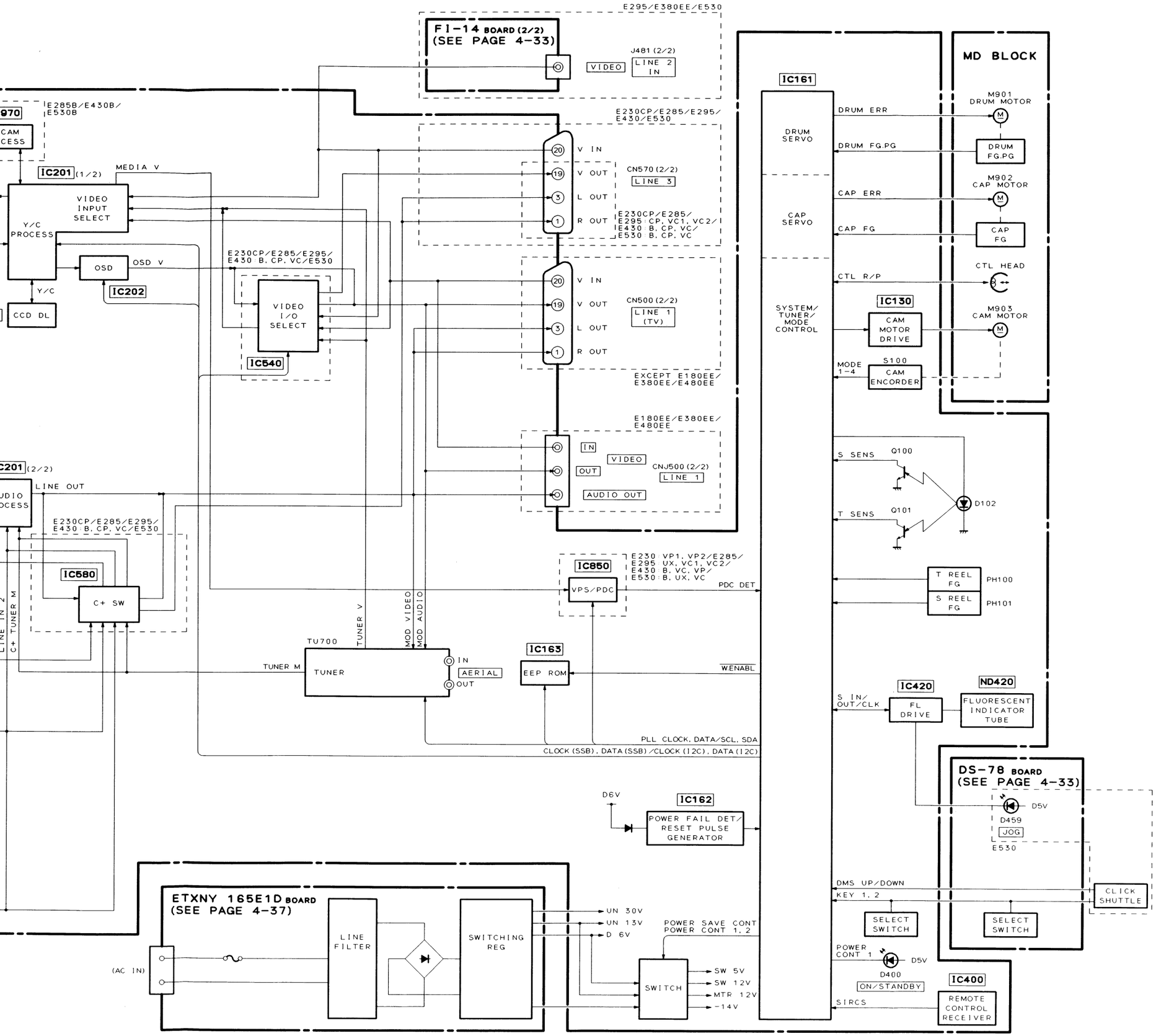
2-9. CIRCUIT BOARDS LOCATION



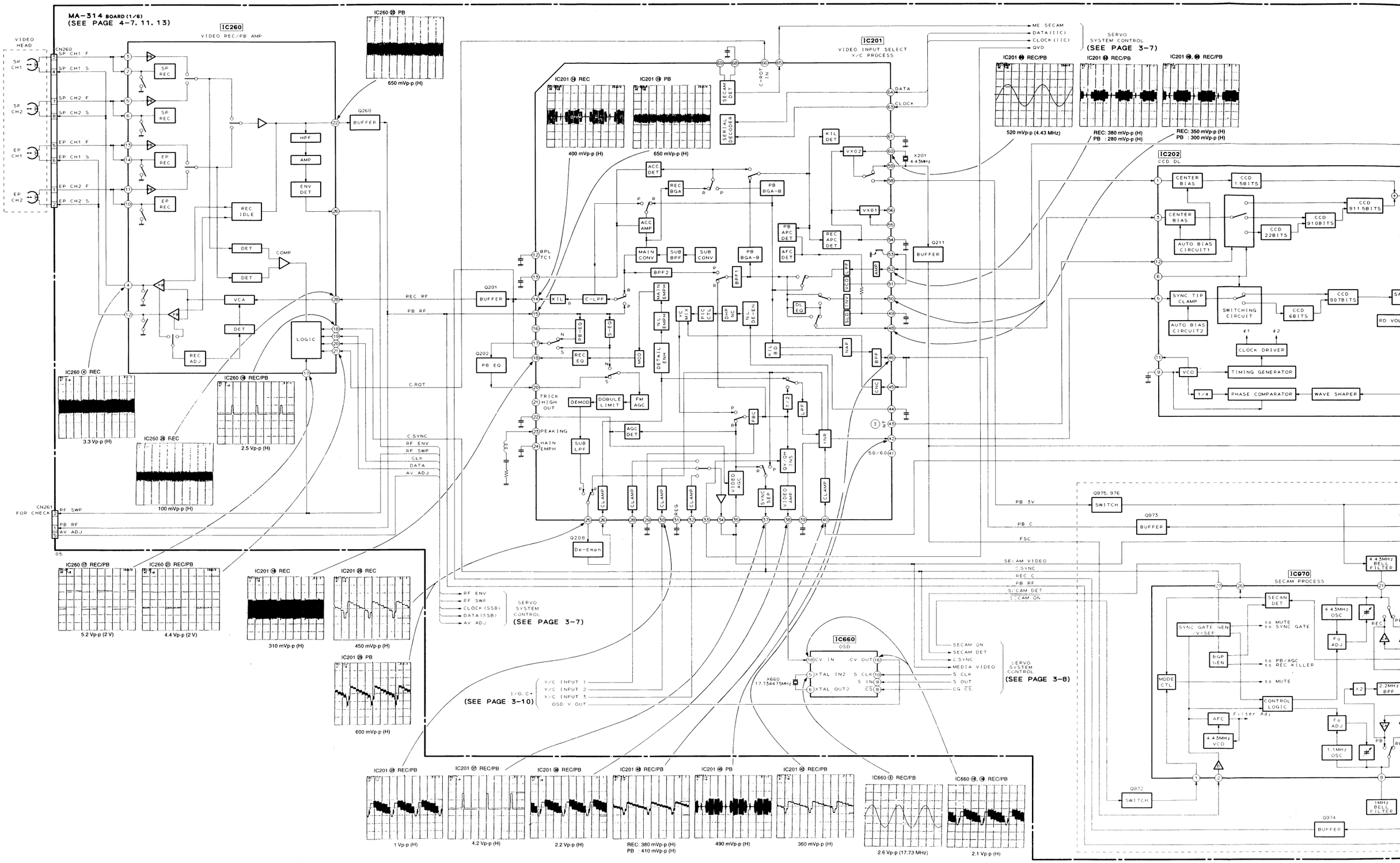
SECTION 3
BLOCK DIAGRAMS

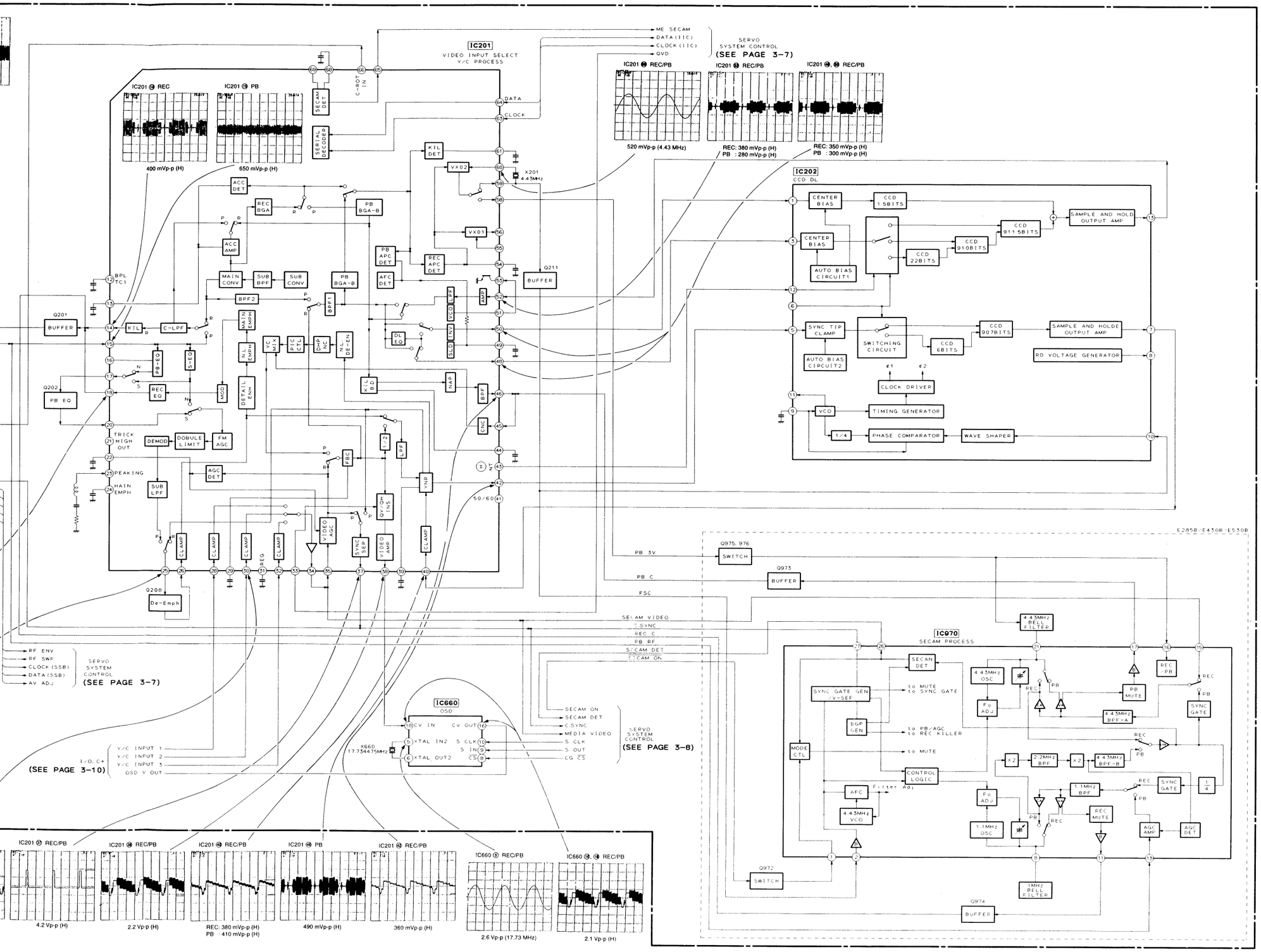
3-1. OVERALL BLOCK DIAGRAM



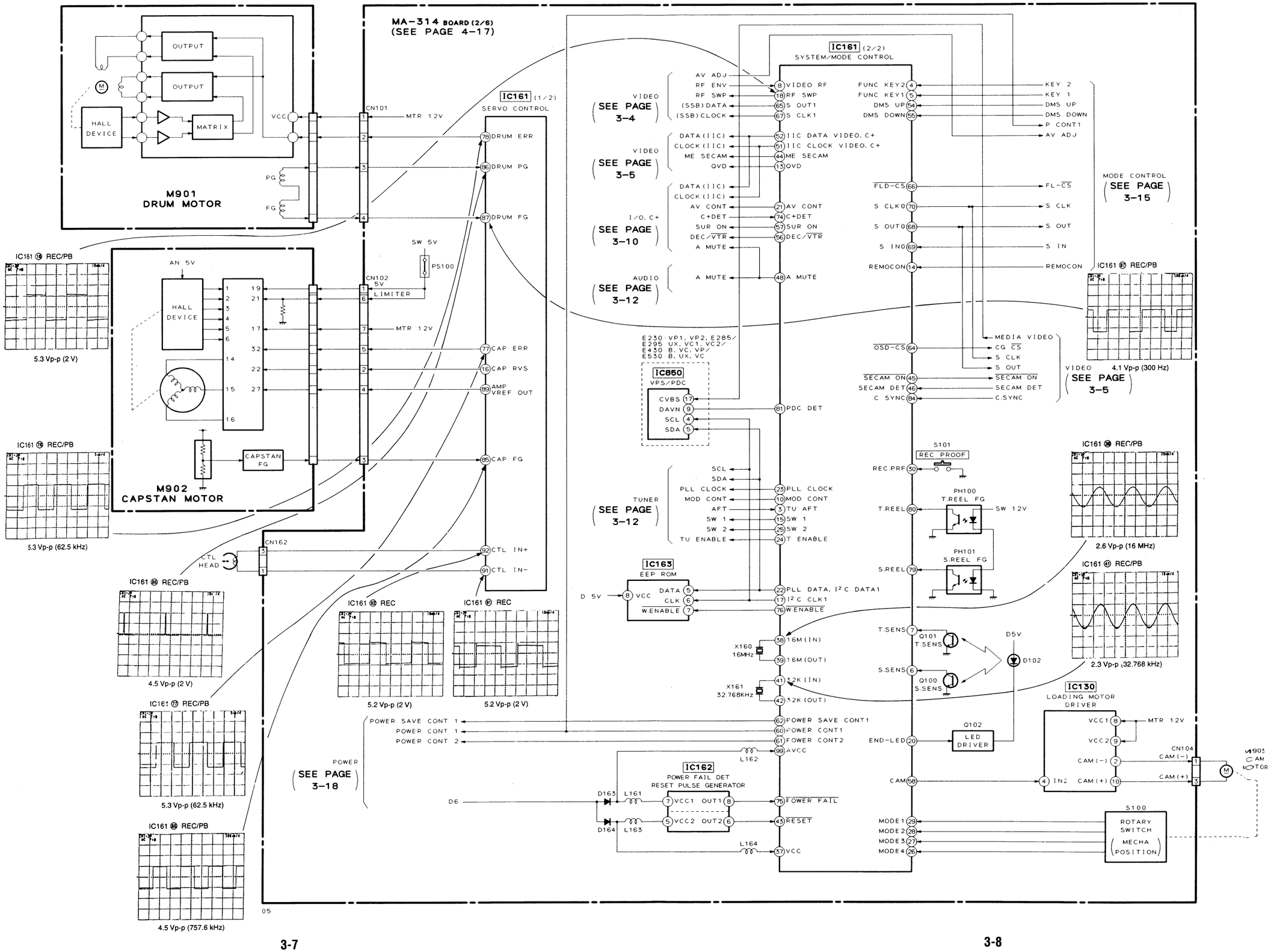

E295/E380EE/E530
FI-14 BOARD (2/2)
(SEE PAGE 4-33)
J481 (2/2)
VIDEO
LINE 2 IN
E285B/E430B/
E530B
970
CAM
CESS
IC201 (1/2)
MEDIA V
VIDEO
INPUT
SELECT
Y/C
PROCESS
OSD
OSD V
IC202
Y/C
CCD DL
E230CP/E285/E295/
E430 B, CP, VC/E530
VIDEO
I/O
SELECT
IC540
E230CP/E285/
E295 CP, VC1, VC2/
E430 B, CP, VC/
E530 B, CP, VC
20
V IN
19
V OUT
3
L OUT
1
R OUT
CN570 (2/2)
LINE 3
CN500 (2/2)
LINE 1
(TV)
EXCEPT E180EE/
E380EE/E480EE
E180EE/E380EE/
E480EE
IN
OUT
VIDEO
AUDIO OUT
CNJ500 (2/2)
LINE 1
C201 (2/2)
UDIO
OCESS
LINE OUT
E230CP/E285/E295/
E430 B, CP, VC/E530
IC580
C+ SW
LINE IN 2
C+ TUNER M
TUNER V
MOD VIDEO
MOD AUDIO
IC850
E230 VP1, VP2/E285/
E295 UX, VC1, VC2/
E430 B, VC, VP/
E530 B, UX, VC
VPS/PDC
PDC DET
TU700
TUNER M
TUNER
IN
AERIAL
OUT
IC163
EEP ROM
W.ENABL
PLL CLOCK, DATA/SCL, SDA
CLOCK (SSB), DATA (SSB)/CLOCK (I2C), DATA (I2C)
D6V
IC162
POWER FAIL DET/
RESET PULSE
GENERATOR
ETXNY 165E1D BOARD
(SEE PAGE 4-37)
(AC IN)
LINE
FILTER
SWITCHING
REG
UN 30V
UN 13V
D 6V
POWER SAVE CONT
POWER CONT 1, 2
SWITCH
SW 5V
SW 12V
MTR 12V
-14V
IC161
DRUM
SERVO
CAP
SERVO
SYSTEM/
TUNER/
MODE
CONTROL
DRUM ERR
DRUM FG.PG
CAP ERR
CAP FG
CTL R/P
IC130
CAM
MOTOR
DRIVE
MODE
1-4
S100
CAM
ENCORDER
MD BLOCK
M901
DRUM MOTOR
DRUM
FG.PG
M902
CAP MOTOR
CAP
FG
CTL HEAD
M903
CAM MOTOR
S SENS
Q100
T SENS
Q101
D102
T REEL
FG
PH100
S REEL
FG
PH101
IC420
S IN/
OUT/CLK
FL
DRIVE
ND420
FLUORESCENT
INDICATOR
TUBE
DS-78 BOARD
(SEE PAGE 4-33)
D5V
D459
JOG
E530
DMS UP/DOWN
KEY 1, 2
CLICK
SHUTTLE
SELECT
SWITCH
SELECT
SWITCH
POWER
CONT 1
D5V
D400
ON/STANDBY
IC400
SIRCS
REMOTE
CONTROL
RECEIVER

3-2. VIDEO BLOCK DIAGRAM

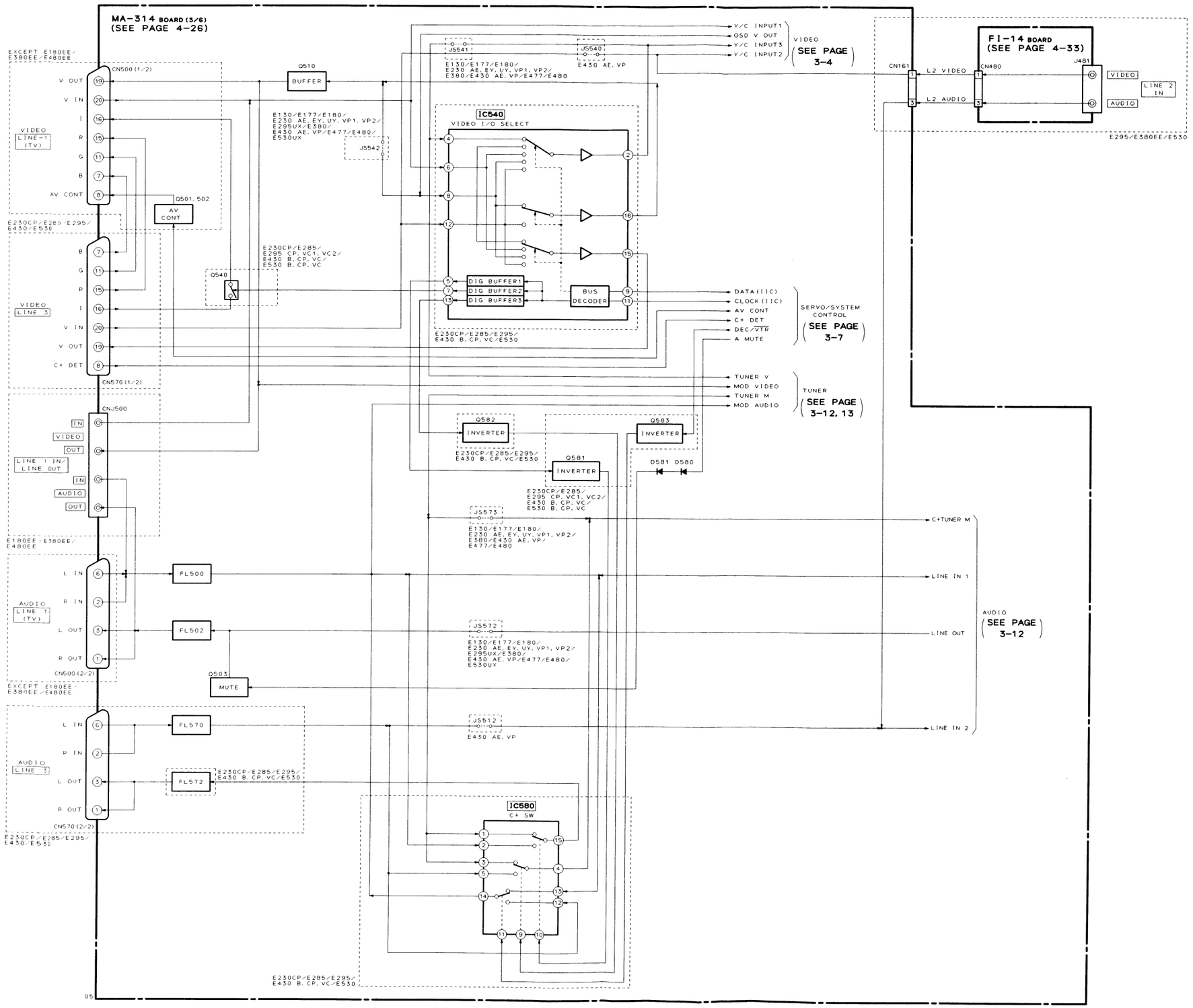



IC201
VIDEO INPUT SELECT
Y/C PROCESS
IC201 ⑭ REC
IC201 ⑮ PB
400 mVp-p (H)
650 mVp-p (H)
SECAM DET
SERIAL DECODER
C-ROT IN
ME SECAM
DATA (IIC)
CLOCK (IIC)
QVD
SERVO SYSTEM CONTROL
(SEE PAGE 3-7)
IC201 ⑭ REC/PB
IC201 ⑮ REC/PB
IC201 ⑰, ⑱ REC/PB
520 mVp-p (4.43 MHz)
REC: 380 mVp-p (H)
PB : 280 mVp-p (H)
REC: 350 mVp-p (H)
PB : 300 mVp-p (H)
DATA
CLOCK
X201
4.43MHz
KIL DET
VX02
VX01
REC APC DET
PB APC DET
AFC DET
ACC DET
ACC AMP
REC BGA
PB BGA-B
MAIN CONV
SUB BPF
SUB CONV
PB BGA-B
Q211
BUFFER
BPL TC1
Q201
BUFFER
KIL
C-LPF
BPF2
BPF1
MAIN EMPH
N.L EMPH
DETAIL ENH
VC MIX
P/C CT
CHR NC
N.L DE-EN
DL EQ
VCO
ENV
SLD
EFR
AMP
PB-EQ
S-EQ
REC EQ
Q202
PB EQ
MOD
KIL BQ
NAR
BPF
CNC
TRICK HIGH OUT
DEMOD
DOBULE LIMIT
FM AGC
PEAKING
HAIN EMPH
SUB LPF
AGC DET
FBC
1/2
LPF
VNR
CHROMA NC
VIDEO AGC
SYNC SEP
VIDEO AMP
CLAMP
REG
Q208
De-Emph
RF ENV
RF SWP
CLOCK (SSB)
DATA (SSB)
AV ADJ
SERVO SYSTEM CONTROL
(SEE PAGE 3-7)
I/O, C+
Y/C INPUT 1
Y/C INPUT 2
Y/C INPUT 3
OSD V OUT
(SEE PAGE 3-10)
IC660
OSD
CV IN
CV OUT
XTAL IN2
XTAL OUT2
S CLK
S IN
CS
X660
17.734475MHz
SECAM ON
SECAM DET
C.SYNC
MEDIA VIDEO
S CLK
S OUT
CG CS
SERVO SYSTEM CONTROL
(SEE PAGE 3-8)
IC202
CCD DL
CENTER BIAS
CCD 15BITS
CENTER BIAS
AUTO BIAS CIRCUIT1
CCD 22BITS
CCD 910BITS
CCD 9115BITS
SAMPLE AND HOLD OUTPUT AMP
SYNC TIP CLAMP
AUTO BIAS CIRCUIT2
SWITCHING CIRCUIT
CCD 6BITS
CCD 907BITS
SAMPLE AND HOLDE OUTPUT AMP
RD VOLTAGE GENERATOR
CLOCK DRIVER
VCO
TIMING GENERATOR
1/4
PHASE COMPARATOR
WAVE SHAPER
E285B/E450B/E530B
Q975, 976
SWITCH
Q973
BUFFER
PB 3V
PB C
FSC
SECAM VIDEO
C.SYNC
REC C
PB RF
SECAM DET
SECAM ON
IC970
SECAM PROCESS
4.43MHz BELL FILTER
SECAM DET
SYNC GATE GEN
V-SEP
to MUTE
to SYNC GATE
BGP GEN
to PB/AGC
to REC KILLER
MODE CTL
to MUTE
CONTROL LOGIC
AFC
Filter Adj
4.43MHz VCO
4.43MHz OSC
Fo ADJ
REF PB
PB MUTE
4.43MHz BPF-A
SYNC GATE
REC
PB
×2
2.2MHz BPF
×2
4.43MHz BPF-B
1.1MHz BPF
1/4
1.1MHz OSC
REC MUTE
AGC AMP
AGC DET
Q972
SWITCH
Q974
BUFFER
1MHz BELL FILTER
IC201 ⑰ REC/PB
4.2 Vp-p (H)
IC201 ⑱ REC/PB
2.2 Vp-p (H)
IC201 ⑭ REC/PB
REC: 380 mVp-p (H)
PB : 410 mVp-p (H)
IC201 ⑮ PB
490 mVp-p (H)
IC201 ⑭ REC/PB
360 mVp-p (H)
IC660 ③ REC/PB
2.6 Vp-p (17.73 MHz)
IC660 ⑰, ⑱ REC/PB
2.1 Vp-p (H)

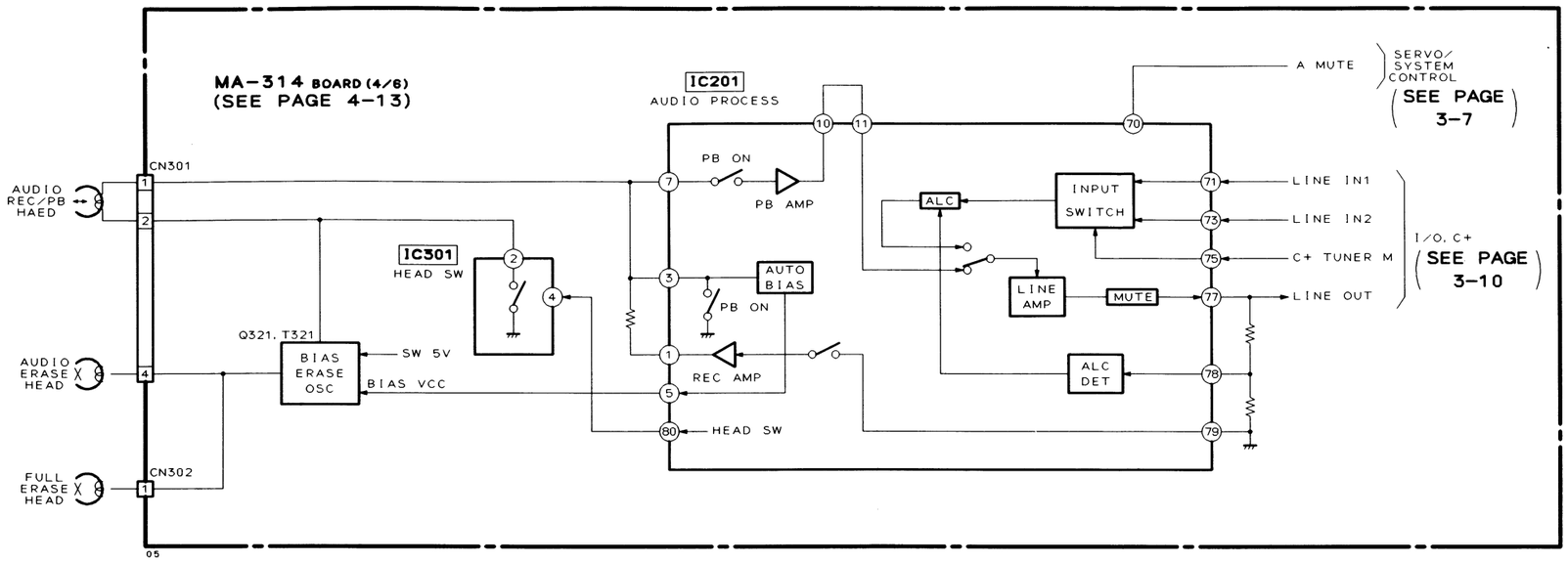
3-3. SERVO/SYSTEM CONTROL BLOCK DIAGRAM



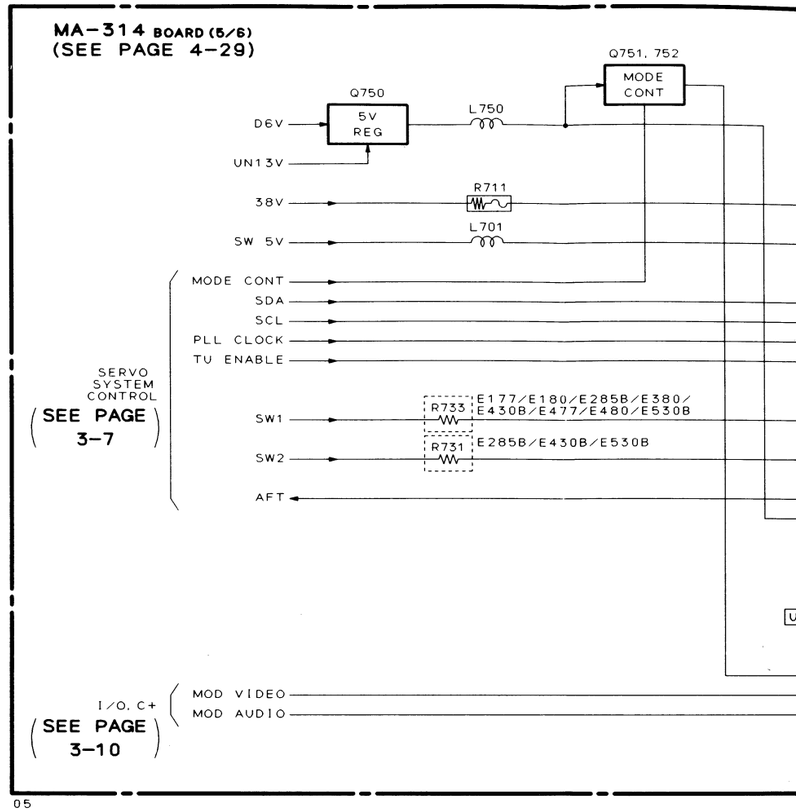
3-4. I/O, C+ BLOCK DIAGRAM



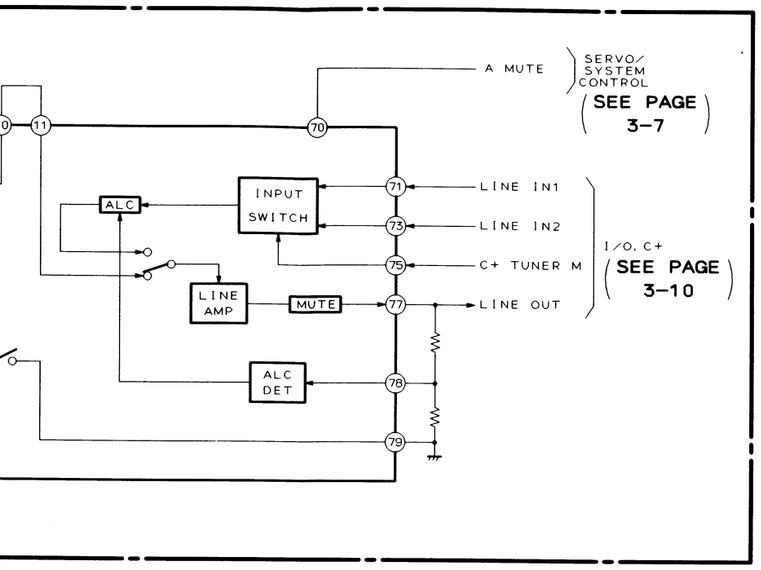
3-5. AUDIO BLOCK DIAGRAM

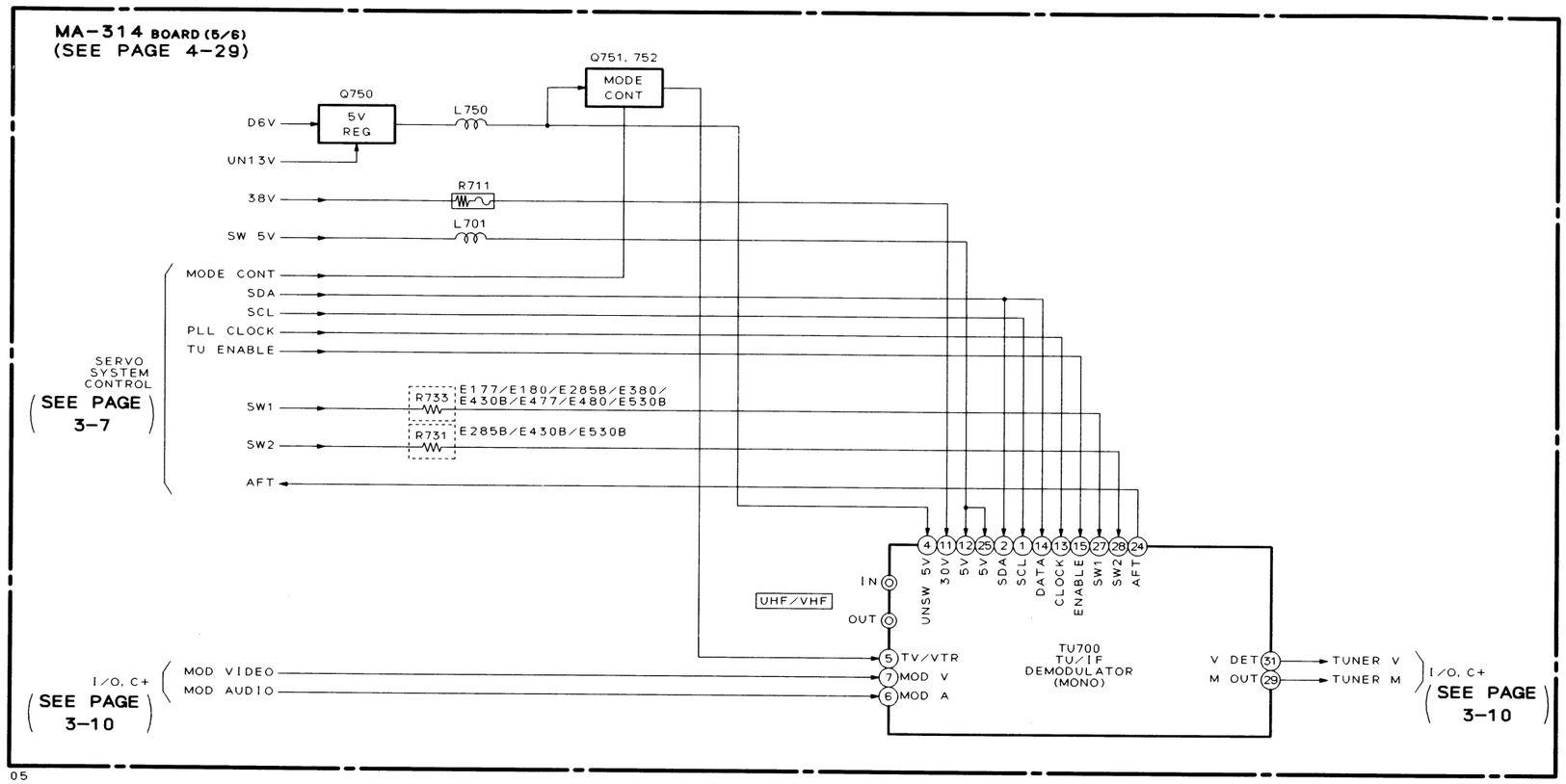


3-6. TUNER BLOCK DIAGRAM



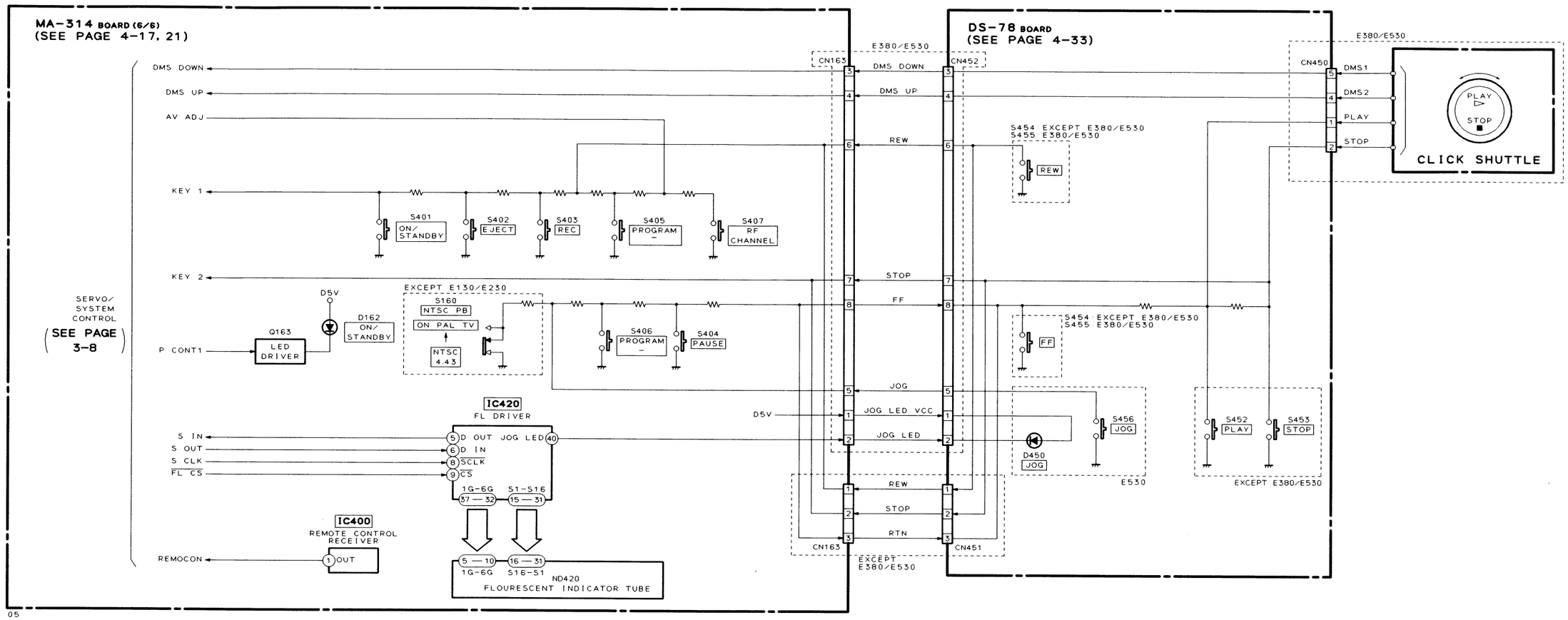
3-6. TUNER BLOCK DIAGRAM



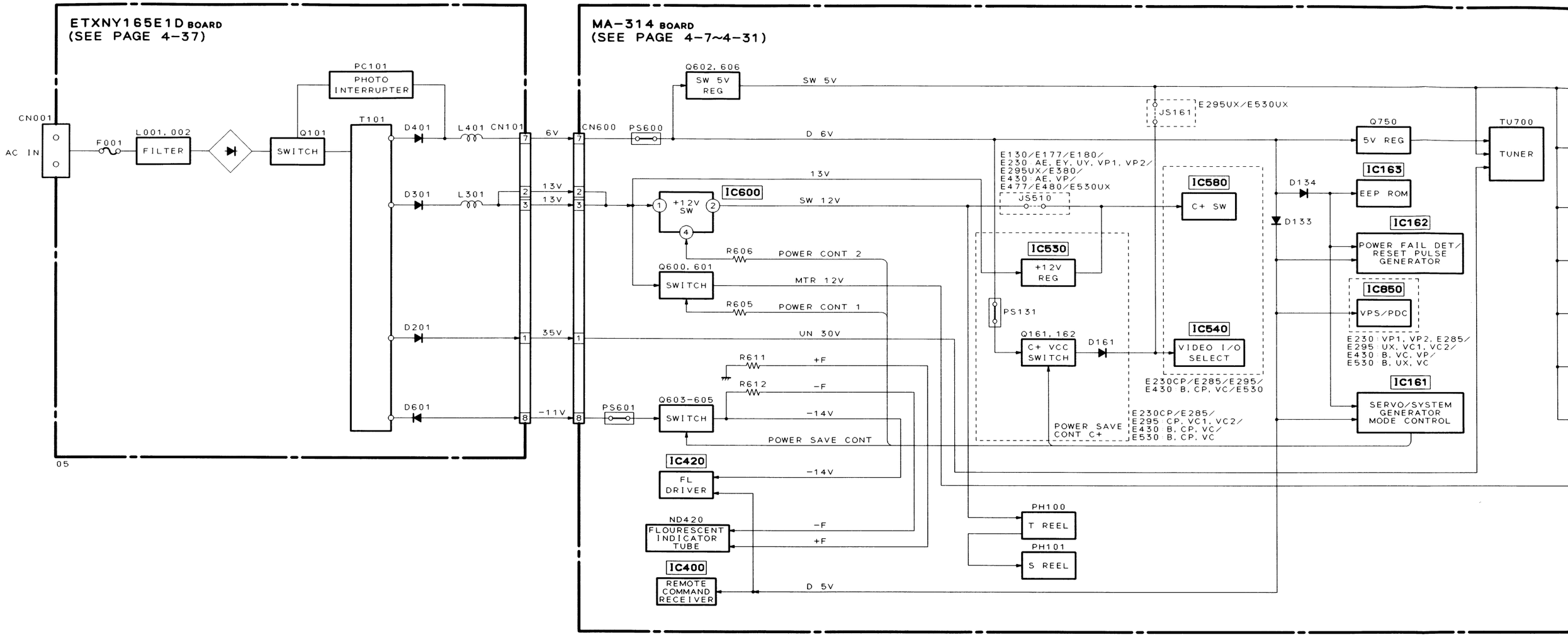


05

3-7. MODE CONTROL BLOCK DIAGRAM



3-8. POWER BLOCK DIAGRAM



MA-314 BOARD
(SEE PAGE 4-7~4-31)

Q602, 606
SW 5V REG
SW 5V
JS161
E295UX/E530UX
CN600
PS600
6V
D 6V
Q750
5V REG
TU700
TUNER
IC201
VIDEO INPUT SELECT Y/C PROCESS NORMAL AUDIO PROCESS
13V
13V
13V
IC600
+12V SW
SW 12V
E130/E177/E180/
E230 AE, EY, UY, VP1, VP2/
E295UX/E380/
E430 AE, VP/
E477/E480/E530UX
JS510
IC580
C+ SW
D134
IC163
EEP ROM
D133
IC162
POWER FAIL DET/ RESET PULSE GENERATOR
IC202
RF-MOD
IC660
OSD
PS100
R606
POWER CONT 2
IC530
+12V REG
Q600, 601
SWITCH
MTR 12V
R605
POWER CONT 1
PS131
IC850
VPS/PDC
E285B/
E430B/
E530B
IC970
SECAM PROCESS
35V
UN 30V
Q161, 162
C+ VCC SWITCH
D161
IC540
VIDEO I/O SELECT
E230 VP1, VP2, E285/
E295 UX, VC1, VC2/
E430 B, VC, VP/
E530 B, UX, VC
IC260
VIDEO REC/PB AMP
R611
+F
R612
-F
E230CP/E285/E295/
E430 B, CP, VC/E530
IC161
SERVO/SYSTEM GENERATOR MODE CONTROL
IC301
HEAD SW
-11V
PS601
Q603-605
SWITCH
-14V
E230CP/E285/
E295 CP, VC1, VC2/
E430 B, CP, VC/
E530 B, CP, VC
POWER SAVE CONT C+
POWER SAVE CONT
SW 5V
M902
CAP MOTOR
MTR 12V
CN102
IC420
-14V
FL DRIVER
D101
MTR 12V
M901
DRUM MOTOR
CN101
PH100
T REEL
IC280
CAM MOTOR DRIVE
CAM(-)
CAM(+)
M903
CAM MOTOR
ND420
FLOURESCENT INDICATOR TUBE
-F
+F
PH101
S REEL
CN104
IC400
REMOTE COMMAND RECEIVER
D 5V

SECTION 4
PRINTED WIRED BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary mote is printed in each block.)

For printed wiring boards:

- ○——— : indicates a lead wire mounted on the component side.
- ●——— : indicates a lead wire mounted on the printed side.
- ○ : Through hole.
- ■ : Parts mounted on the conductor side.
- ▒▒▒ : Pattern from the side which enables seeing.
- ▒▒▒ : Pattern on the rear side.*
- Circled numbers refer to waveforms.

Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component Side)	Parts on the parts face side seen from the parts face are indicated.

For schematic Diagram:

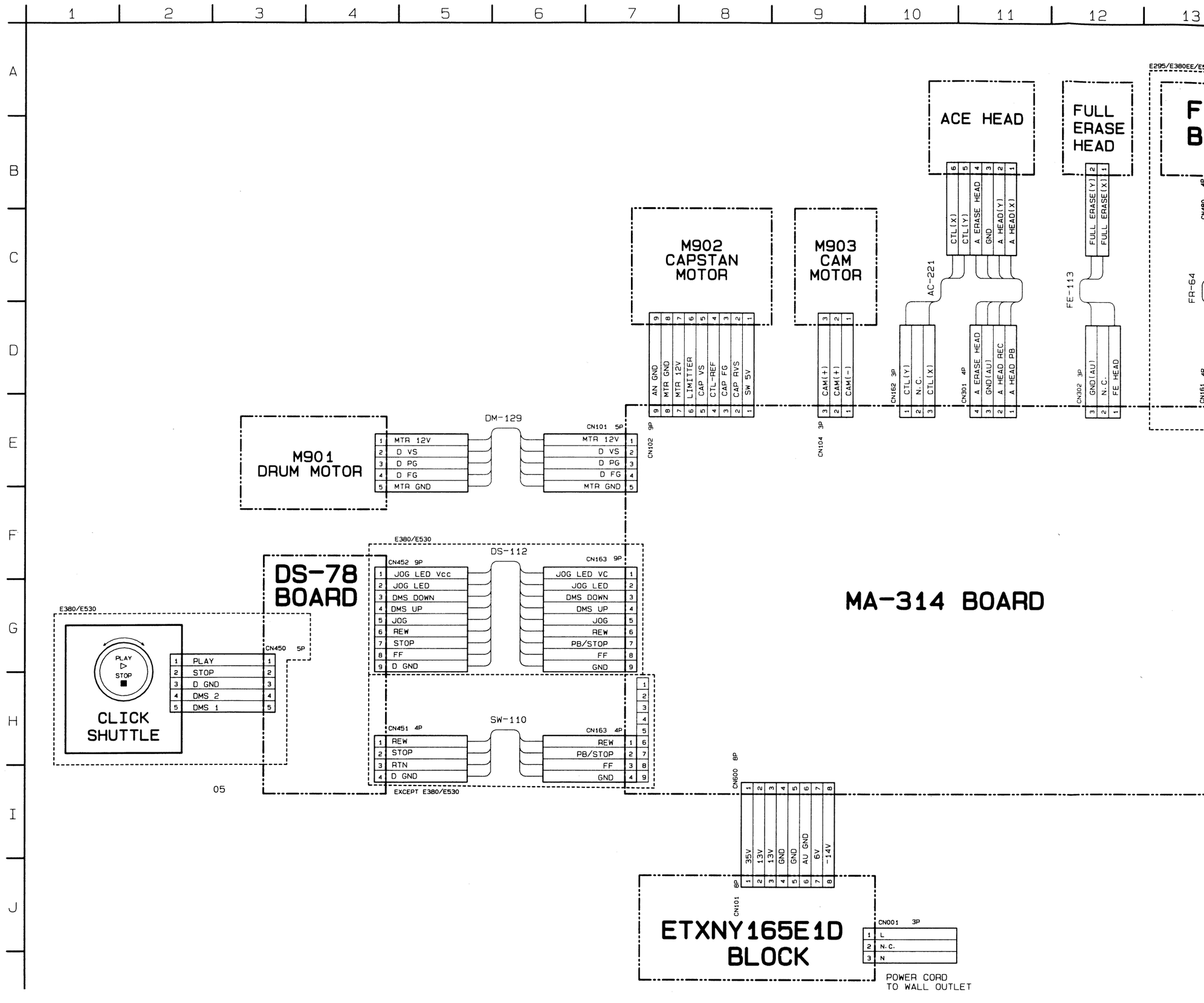
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4 W (Chip resistors : 1/10 W) unless otherwise specified.
  kΩ : 1000Ω, MW : 1000kΩ.
- All capacitors are in μF unless otherwise noted. pF : μμF 50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ⊣▭⊢ : nonflammable resistor.
- ⊣▭⊢ : fusible resistor.
- ▭ : panel designation.
- △ : internal component.
- ▭ : adjustment for repair.*
- ——— : B+ Line.*
- - - - : B– Line.*
- ⇨ : IN/OUT direction of B line (+, –).*
- Circled numbers refer to waveforms.*
- Voltages are dc between measurement point.*
- Readings are taken with a color-bar signal input.*
- Readings are taken with a digital multimeter (DC 10MW).*
- Voltage variations may be noted due to normal production tolerances.*

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- * : indicated by the color red.

4-1. FRAME SCHEMATIC DIAGRAM



3 4 5 6 7 8 9 10 11 12 13 14 15 16

A B C D E F G H I J

M901 DRUM MOTOR

1	MTR 12V
2	D VS
3	D PG
4	D FG
5	MTR GND

DM-129

CN101 5P

MTR 12V	1
D VS	2
D PG	3
D FG	4
MTR GND	5

CN102 9P

M902 CAPSTAN MOTOR

9	AN GND
8	MTR GND
7	MTR 12V
6	LIMITTER
5	CAP VS
4	CTL-REF
3	CAP FG
2	CAP RVS
1	SW 5V

CN104 3P

M903 CAM MOTOR

3	CAM(+)
2	CAM(+)
1	CAM(-)

ACE HEAD

6	CTL(X)
5	CTL(Y)
4	A ERASE HEAD
3	GND
2	A HEAD(Y)
1	A HEAD(X)

AC-221

CN162 3P

1	CTL(Y)
2	N.C.
3	CTL(X)

CN301 4P

4	A ERASE HEAD
3	GND(AU)
2	A HEAD REC
1	A HEAD PB

FULL ERASE HEAD

2	FULL ERASE(Y)
1	FULL ERASE(X)

FE-113

CN302 3P

3	GND(AU)
2	N.C.
1	FE HEAD

E295/E380EE/E530

FI-14 BOARD

CN480 4P

1	L2 VIDEO
2	AN GND
3	L2 AUDIO
4	AU GND

FR-64

CN161 4P

1	L2 VIDEO
2	AN GND
3	L2 AUDIO
4	AU GND

CN260 8P

8	SP CH2 S
7	SP CH2 F
6	EP CH1 S
5	EP CH1 F
4	SP CH1 S
3	SP CH1 F
2	EP CH2 S
1	EP CH2 F

SP CH2
EP CH1
SP CH1
EP CH2

E380/E530

DS-78 BOARD

DS-112

CN452 9P

1	JOG LED Vcc
2	JOG LED
3	DMS DOWN
4	DMS UP
5	JOG
6	REW
7	STOP
8	FF
9	D GND

CN163 9P

JOG LED VC	1
JOG LED	2
DMS DOWN	3
DMS UP	4
JOG	5
REW	6
PB/STOP	7
FF	8
GND	9

CN450 5P

PLAY	1
STOP	2
D GND	3
DMS 2	4
DMS 1	5

SW-110

CN451 4P

1	REW
2	STOP
3	RTN
4	D GND

CN163 4P

REW	1 6
PB/STOP	2 7
FF	3 8
GND	4 9

EXCEPT E380/E530

MA-314 BOARD

CN262 5P

1	PB RF
2	RF SWP
3	GND
4	CTL
5	AV ADJ

CHECK

CN600 8P

35V	13V	13V	GND	GND	AU GND	6V	-14V
1	2	3	4	5	6	7	8

CN101 8P

ETXNY165E1D BLOCK

CN001 3P

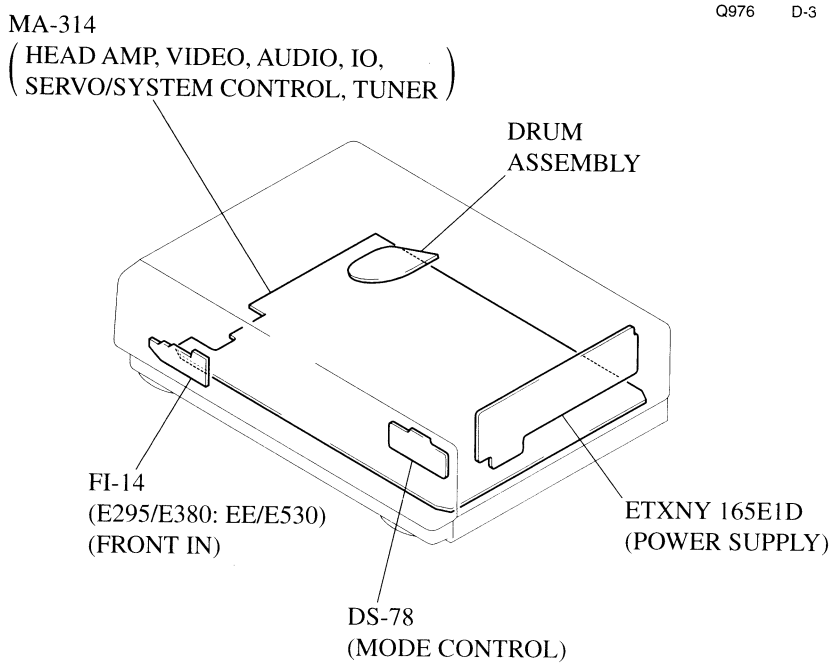
1	L
2	N.C.
3	N

POWER CORD TO WALL OUTLET

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

MA-314 BOARD

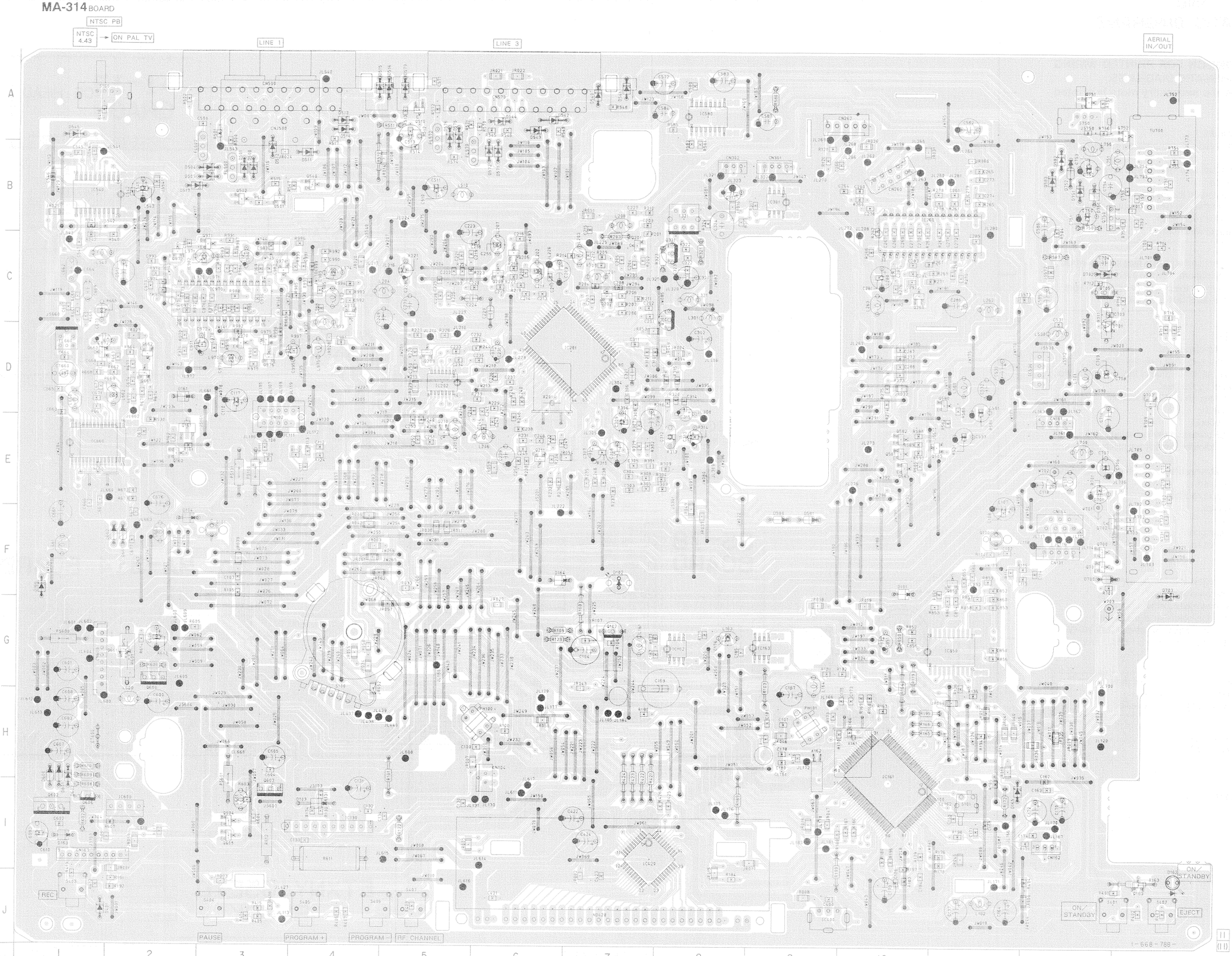
CN101	F-12	IC130	I-4
CN102	E-3	IC161	H-10
CN104	H-6	IC162	G-8
CN161	E-12	IC163	G-9
CN162	I-12	IC201	D-7
CN163	I-1	IC202	D-5
CN260	B-10	IC260	B-10
CN262	A-10	IC301	B-9
CN301	B-9	IC400	J-9
CN302	B-8	IC420	I-7
CN500	A-3	IC530	D-12
CN570	A-6	IC540	B-1
CN600	G-1	IC580	A-8
		IC600	I-2
D101	F-10	IC660	E-1
D102	F-7	IC850	G-11
D104	F-2	IC970	C-3
D161	D-2		
D162	J-13	Q100	F-11
D163	I-1	Q101	F-3
D164	F-6	Q102	G-7
D165	I-12	Q161	E-2
D166	F-1	Q162	E-2
D401	J-1	Q163	J-13
D500	B-3	Q201	C-7
D501	B-3	Q202	C-7
D504	B-3	Q208	C-6
D505	B-3	Q209	D-5
D511	B-4	Q210	E-2
D512	B-3	Q211	E-6
D513	A-4	Q260	C-10
D514	A-4	Q301	C-8
D515	A-4	Q321	C-8
D516	A-5	Q501	B-3
D517	B-2	Q502	B-3
D540	A-7	Q503	E-11
D541	A-7	Q510	A-5
D542	A-6	Q540	B-4
D543	A-6	Q580	D-11
D544	A-6	Q581	E-10
D545	A-1	Q582	E-10
D571	B-6	Q583	E-10
D572	B-6	Q600	G-2
D575	A-5	Q601	G-2
D576	A-5	Q602	I-1
D579	A-5	Q603	I-3
D580	F-9	Q604	I-3
D581	F-9	Q605	I-3
D582	B-12	Q606	I-1
D583	B-12	Q660	D-1
D600	H-1	Q661	D-2
D601	H-1	Q662	D-2
D602	H-1	Q750	B-13
D661	F-1	Q751	A-12
D662	F-2	Q752	A-13
D702	C-12	Q850	F-11
D703	F-13	Q970	D-3
D751	B-12	Q972	C-2
D752	B-12	Q974	C-3
		Q975	D-3
		Q976	D-3



MA-314 (HEAD AMP, VIDEO, AUDIO, IO, SERVO/SYSM CONTROL, TUNER) PRINTED WIRING BOARD

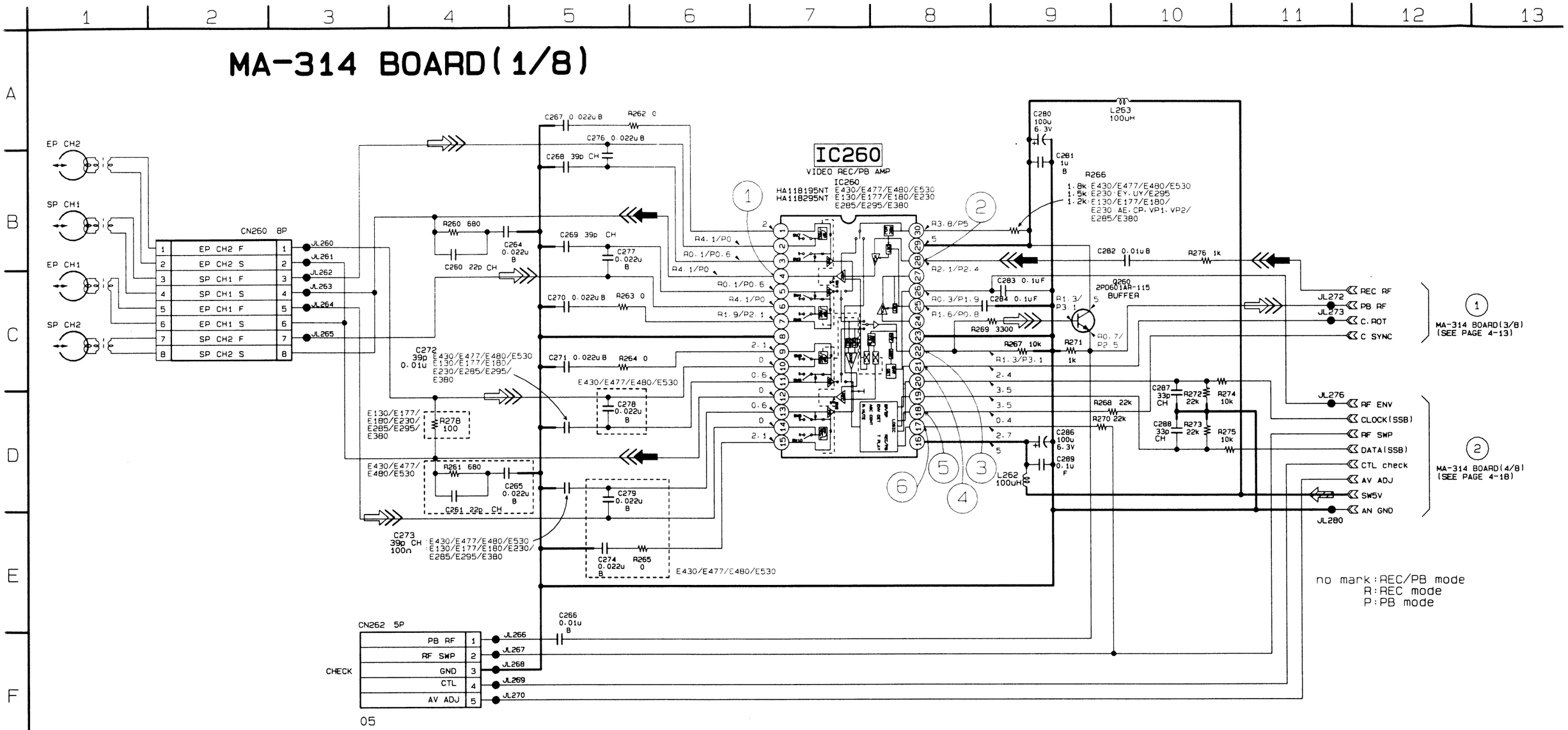
– Ref. No.: MA-314 board; 1,000 series –

There are few cases that the part isn't mounted in this model is printed on this diagram.



MA-314 (HEAD AMP) SCHEMATIC DIAGRAM

– Ref. No.: MA-314 board; 1,000 series –

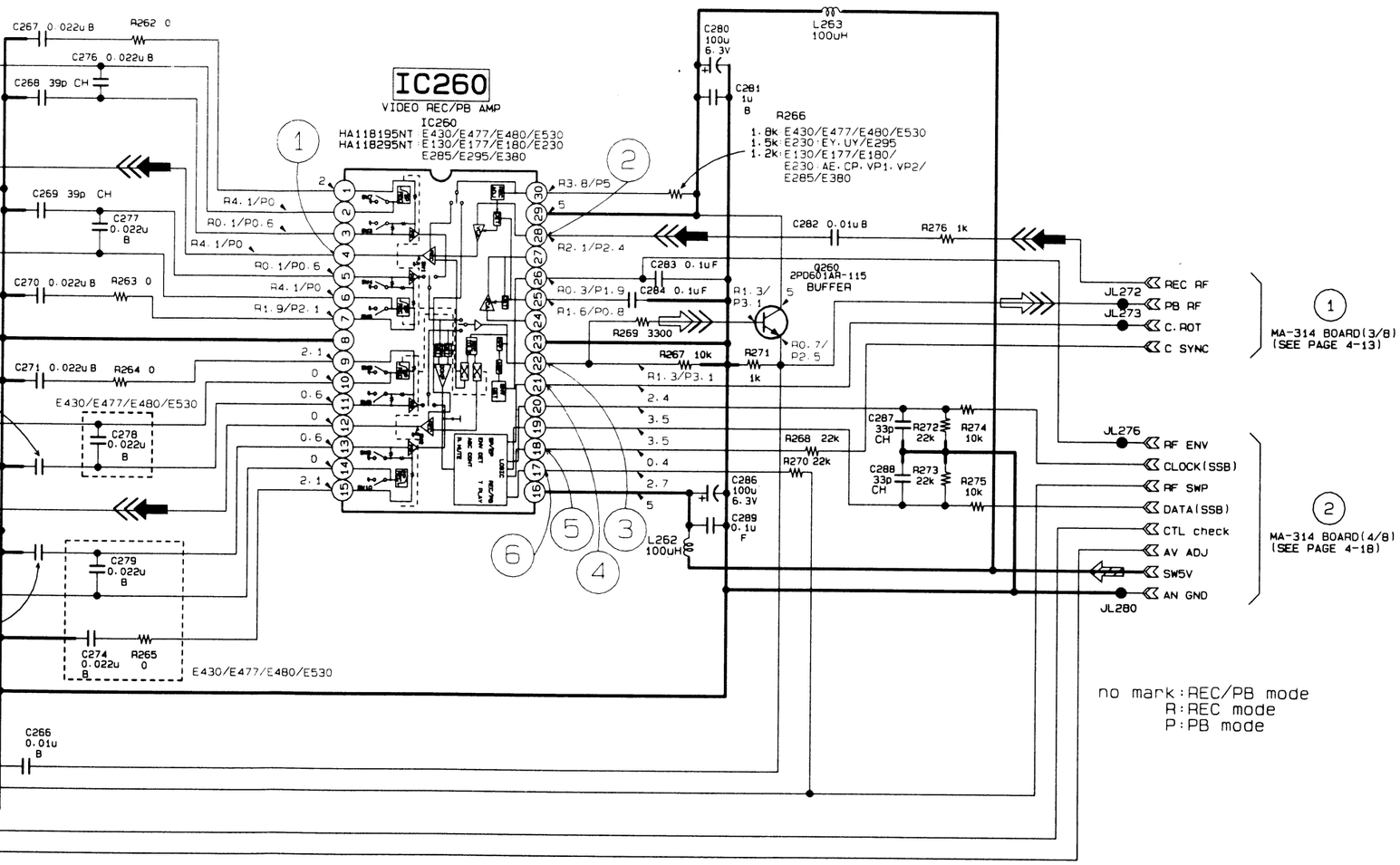


- Signal path

	VIDEO SIGNAL
	Y/CHROMA
REC	➡
PB	⇨

5 6 7 8 9 10 11 12 13

/8)

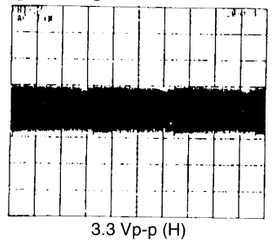


- Signal path

	VIDEO SIGNAL
	Y/CHROMA
REC	➡
PB	⇨

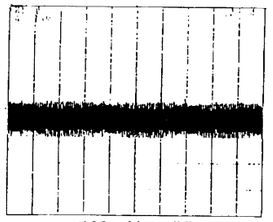
- **Waveforms**

❶ IC260 ④ REC



3.3 Vp-p (H)

❷ IC260 ㉘ REC

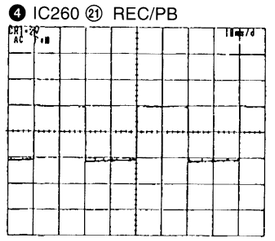


100 mVp-p (H)

❸ IC260 ㉒ PB

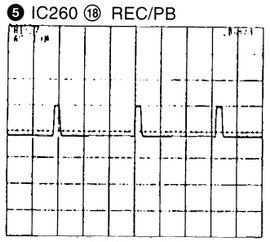
650 mVp-p (H)

❹ IC260 ㉑ REC/PB



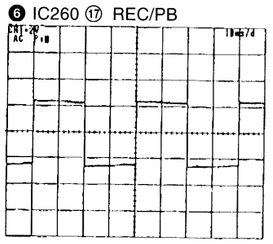
4.4 Vp-p (2 V)

❺ IC260 ⑱ REC/PB



2.5 Vp-p (H)

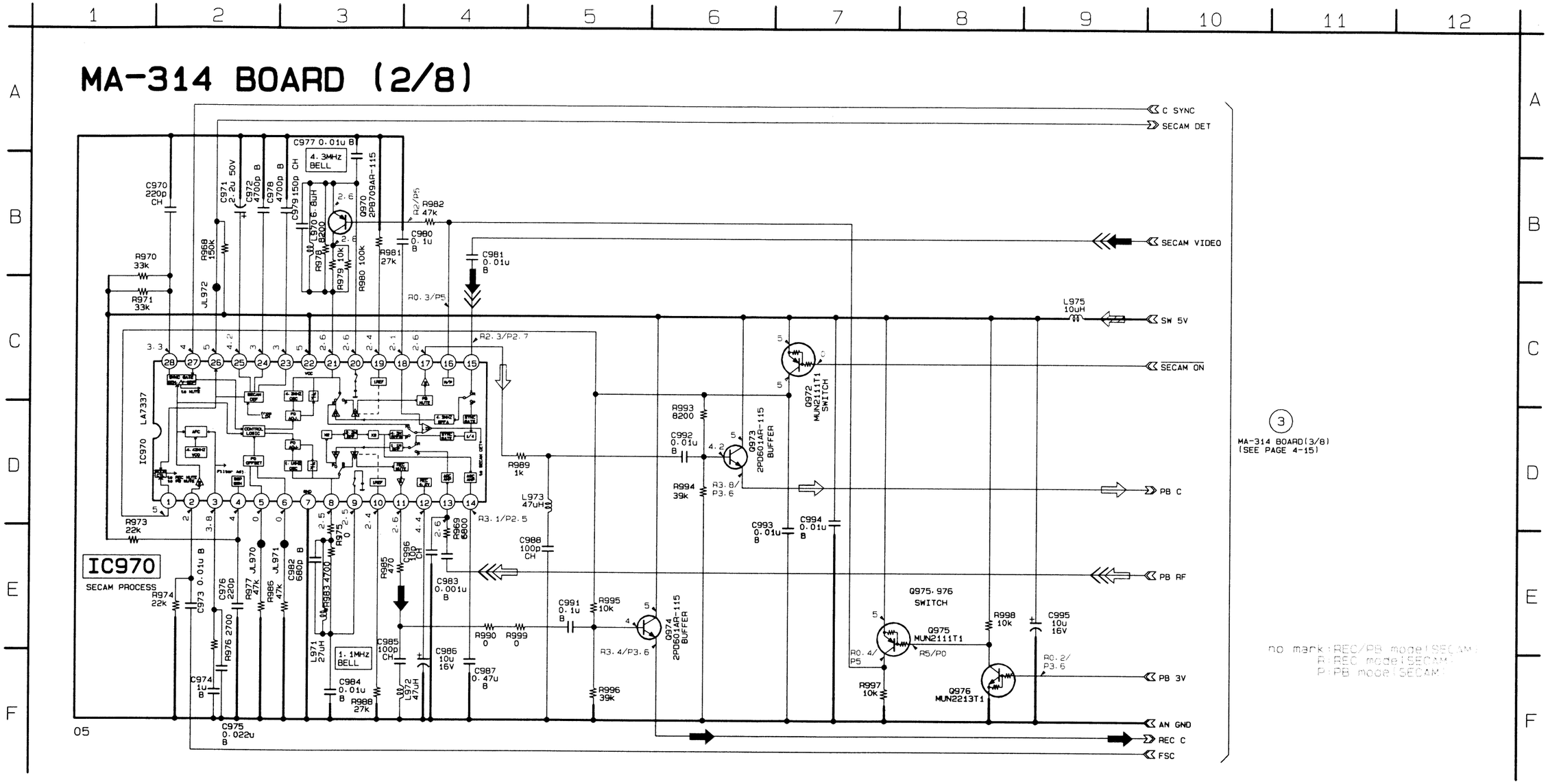
❻ IC260 ⑰ REC/PB



5.2 Vp-p (2 V)

MA-314 (SECAM) SCHEMATIC DIAGRAM • **See page 4-4 to 4-6 for printed wiring board.**

– Ref. No.: MA-314 board; 1,000 series –

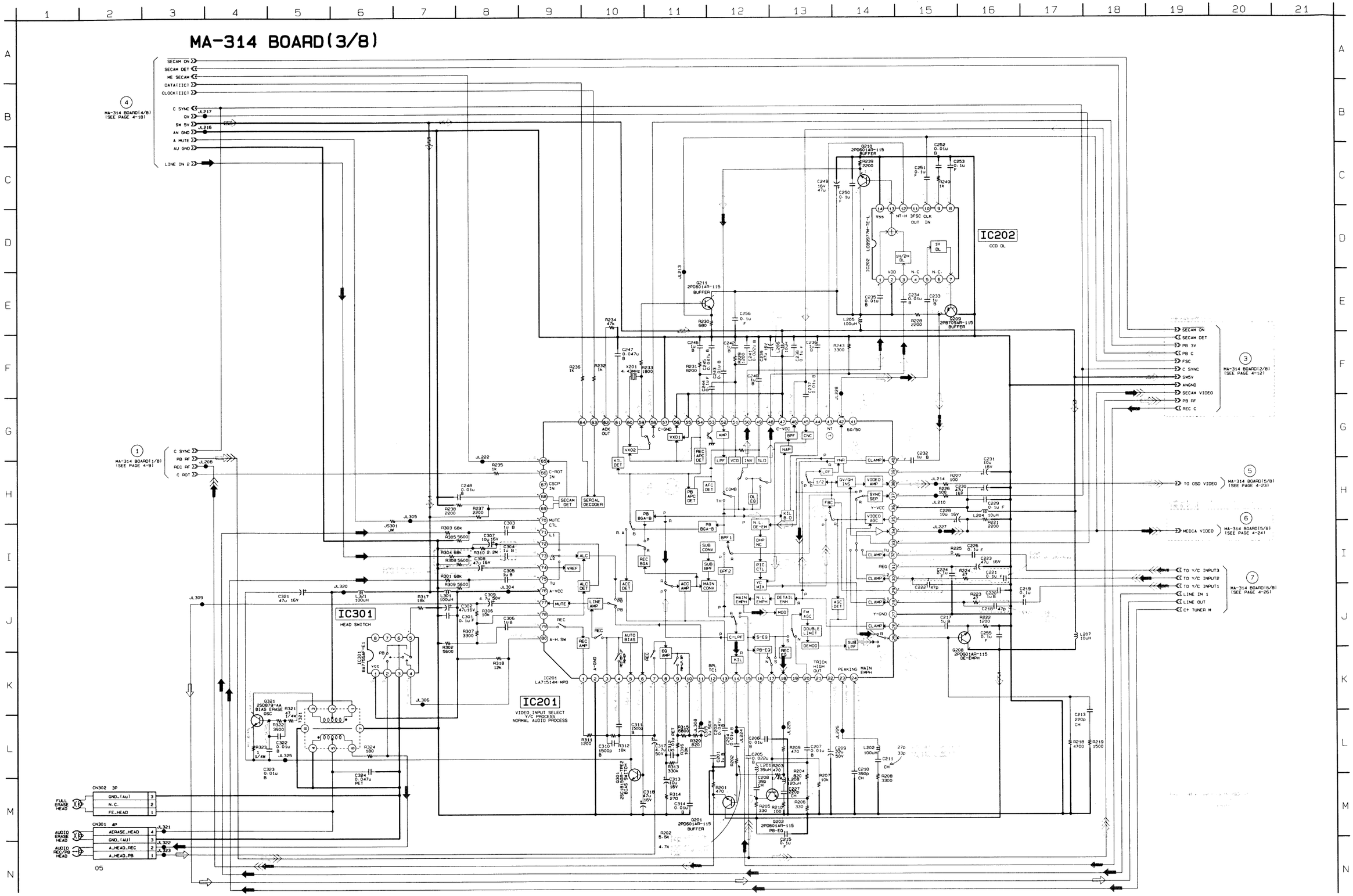


• Signal path

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC	➡	⇉	⋙
PB	⇨	⇉	⋙

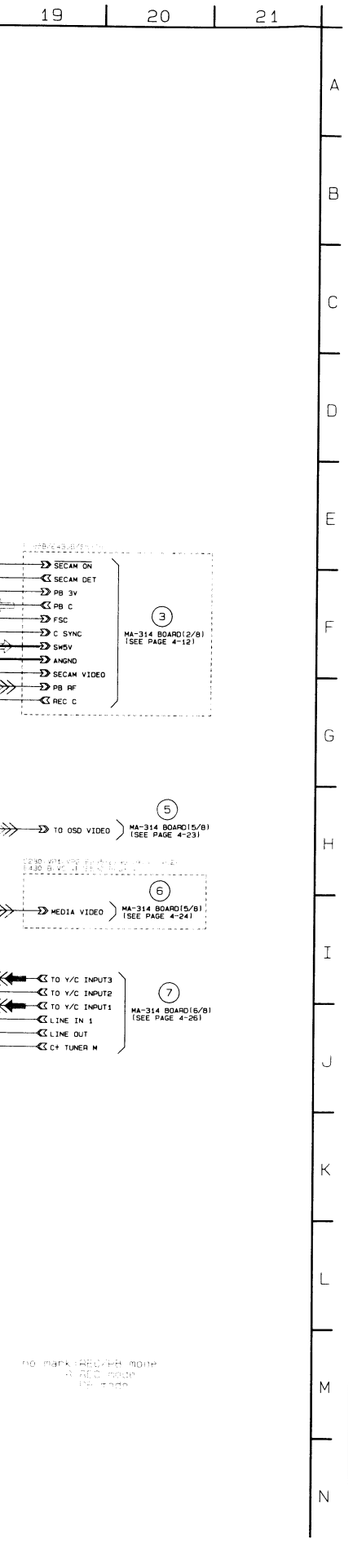
MA-314 (VIDEO, AUDIO) SCHEMATIC DIAGRAM • See page 4-4 to 4-6 for printed wiring board.

– Ref. No.: MA-314 board; 1,000 series –



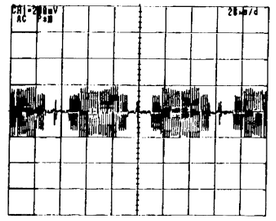
- Signal path

	VI
	CHROMA
REC	
PB	



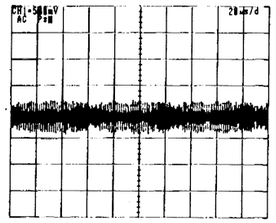
• **Waveforms**

❶ IC201 ⑭ REC



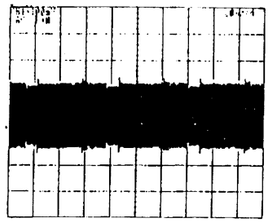
400 mVp-p (H)

❷ IC201 ⑮ PB



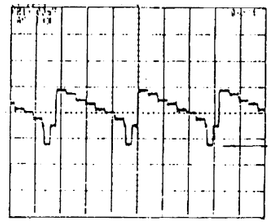
650 mVp-p (H)

❸ IC201 ⑱ REC



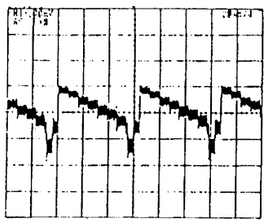
310 mVp-p (H)

❹ IC201 ㉕ REC



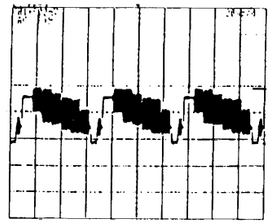
450 mVp-p (H)

❺ IC201 ㉕ PB



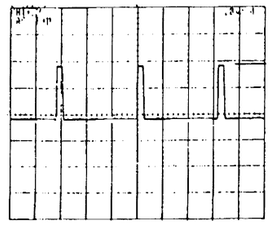
600 mVp-p (H)

❻ IC201 ㉚ REC/PB



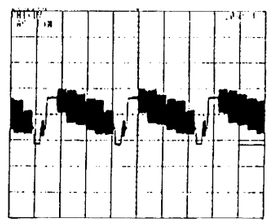
1 Vp-p (H)

❼ IC201 ㊲ REC/PB



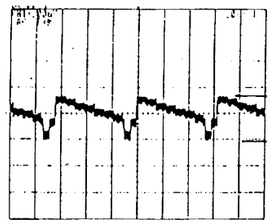
4.2 Vp-p (H)

❽ IC201 ㊳ REC/PB



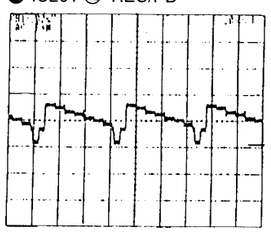
2.2 Vp-p (H)

❾ IC201 ㊵ REC/PB



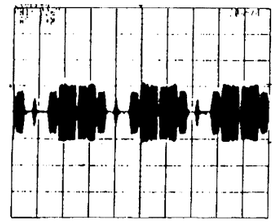
REC: 380 mVp-p (H)
PB : 410 mVp-p (H)

❿ IC201 ㊷ REC/PB



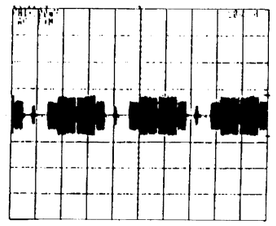
360 mVp-p (H)

⓫ IC201 ㊻ PB



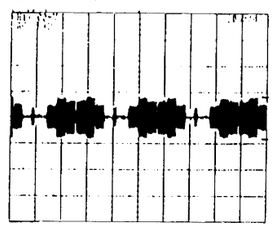
490 mVp-p (H)

⓬ IC201 ㊽, ㊿ REC/PB



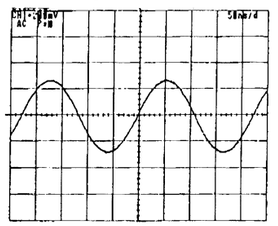
REC: 350 mVp-p (H)
PB : 300 mVp-p (H)

⓭ IC201 ㊷ REC/PB



REC: 380 mVp-p (H)
PB : 280 mVp-p (H)

⓮ IC201 ㊿ REC/PB



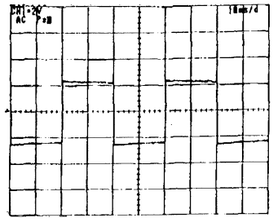
520 mVp-p (4.43 MHz)

• Signal path

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡	➡	➡
PB	⇨	⇨	⇨	⇨

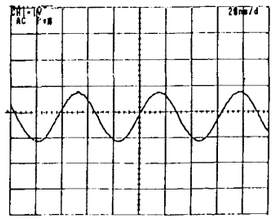
• Waveforms

❶ IC161 ⑱ REC/PB



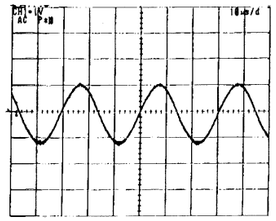
5.3 Vp-p (2 V)

❷ IC161 ㊳ REC/PB



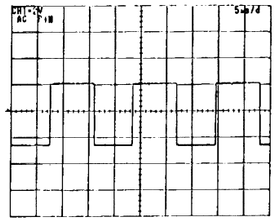
2.6 Vp-p (16 MHz)

❸ IC161 ㊶ REC/PB



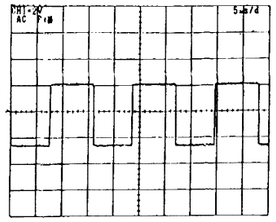
2.3 Vp-p (32.768 kHz)

❹ IC161 ㊼ REC/PB



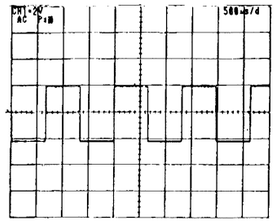
5.3 Vp-p (62.5 kHz)

❺ IC161 ㊽ REC/PB



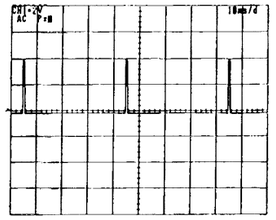
5.3 Vp-p (62.5 kHz)

❻ IC161 ㊺ REC/PB



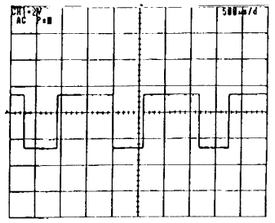
4.5 Vp-p (757.6 kHz)

❼ IC161 ㊻ REC/PB



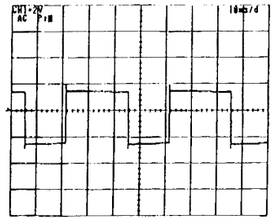
4.5 Vp-p (2 V)

❽ IC161 ㊼ REC/PB



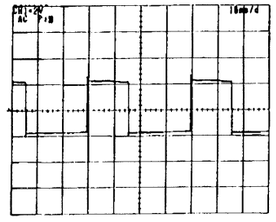
4.1 Vp-p (300 Hz)

❾ IC161 ㊶ REC



5.2 Vp-p (2 V)

❿ IC161 ㊷ REC



5.2 Vp-p (2 V)

- Signal path

	VIDEO SIGNAL	AUDIO SIGNAL
	Y/CHROMA	
REC	➡⋙	➡
PB	⇨⋙	⇨

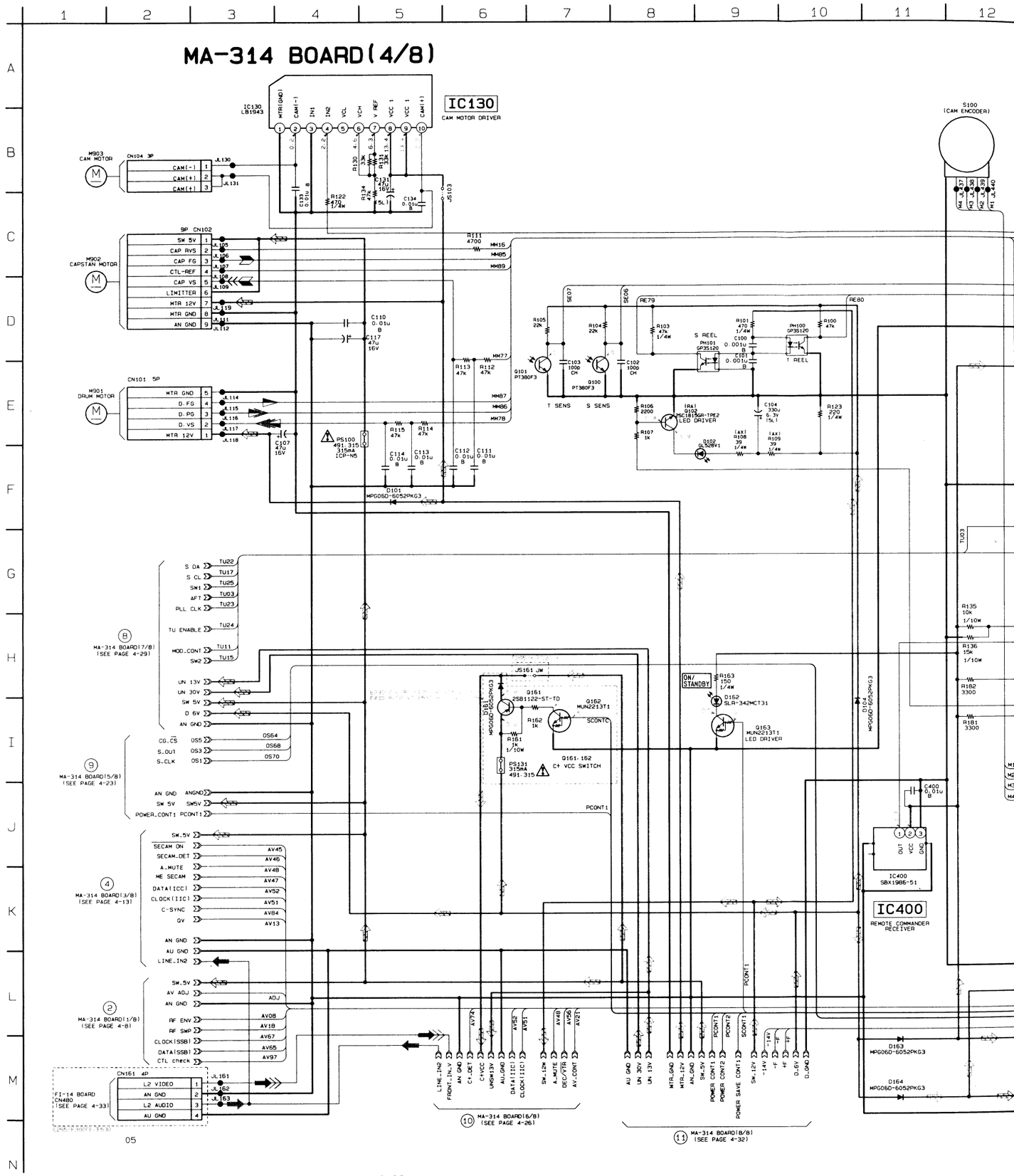
- Signal path

	REC	REC/PB	PB
Drum speed servo		▻	
Drum phase servo		⋗	
Drum servo (speed and phase)		⋙	
Capstan speed servo		▰	
Capstan servo (speed and phase)		▰⋙	
Ref. signal	▰		▱

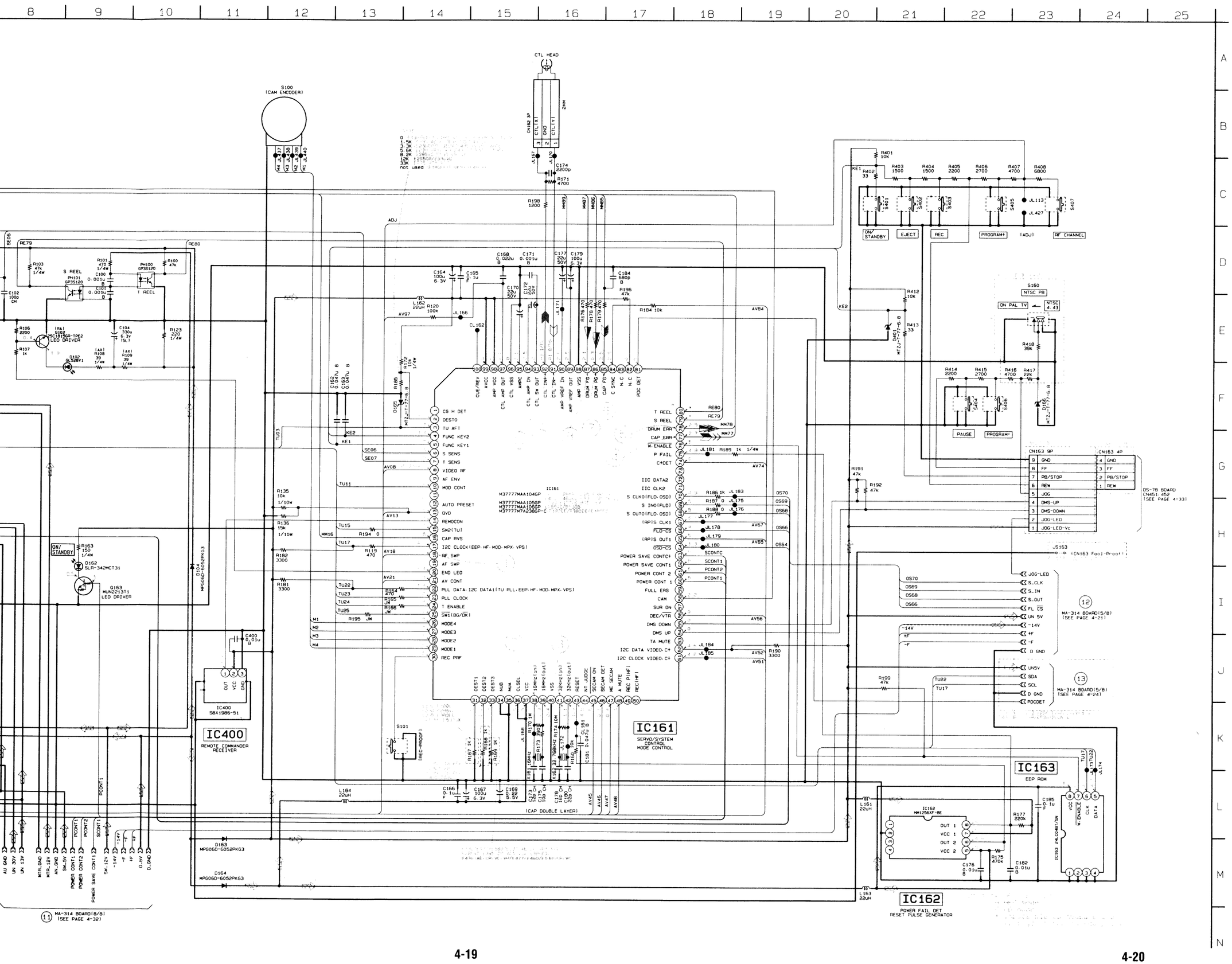
Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

MA-314 (SERVO/SYSTEM CONTROL) SCHEMATIC DIAGRAM • See page 4-4 to 4-6 for printed wiring board.

– Ref. No.: MA-314 board; 1,000 series –



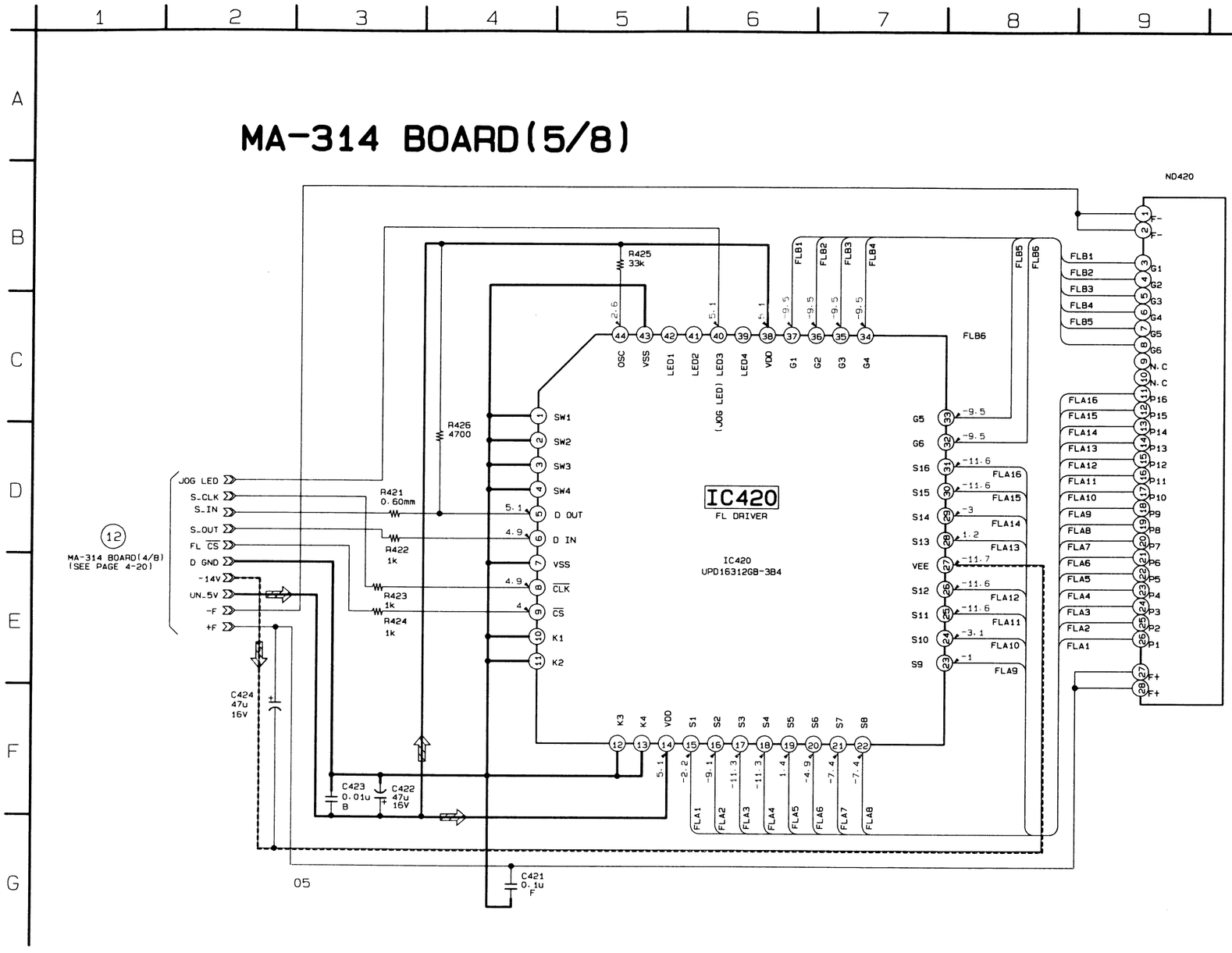
6 for printed wiring board.

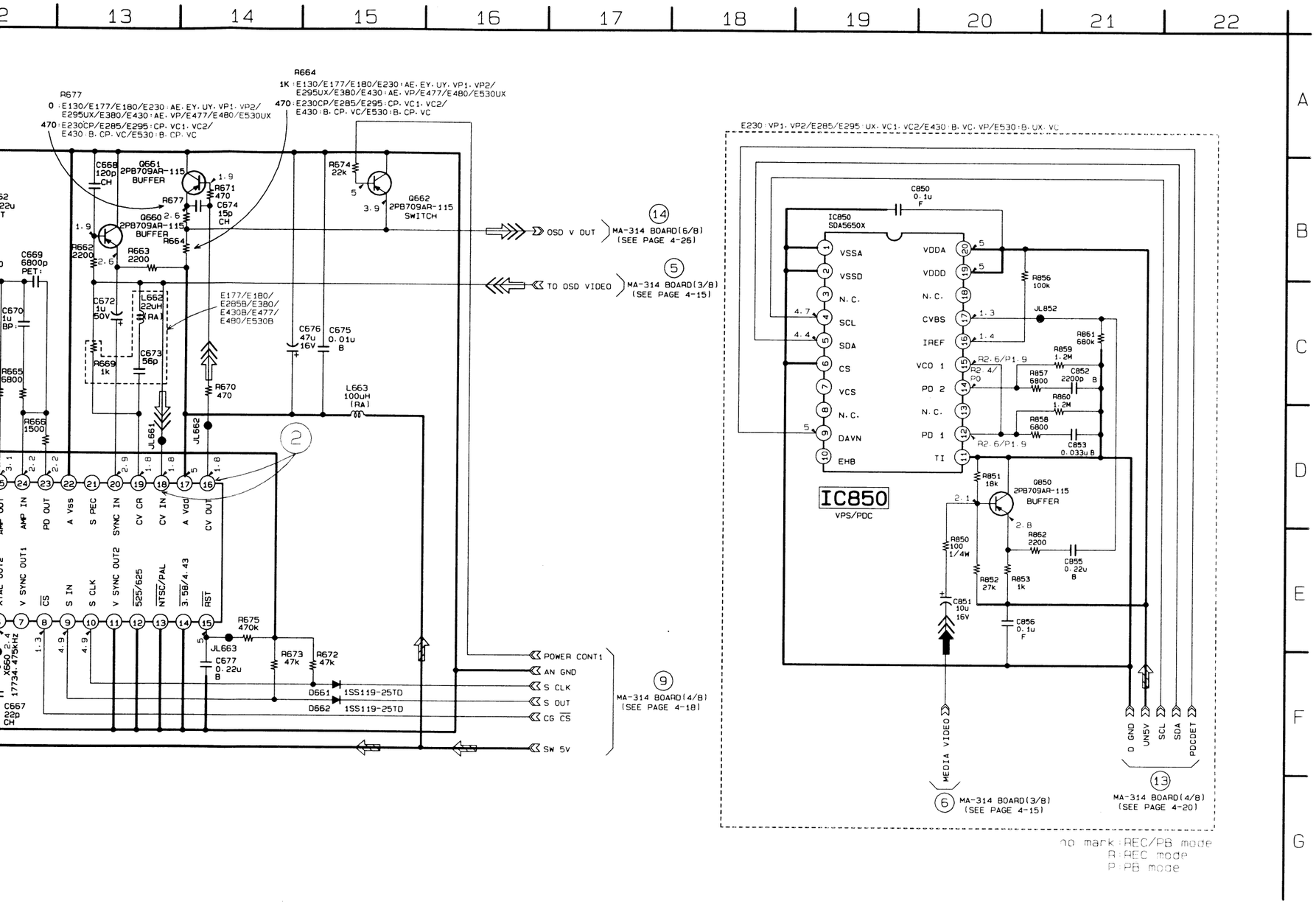


MA-314 (FL DRIVER, OSD, VPS/PDC) SCHEMATIC DIAGRAM • See page 4-4 to 4-6 for printed wiring board.

– Ref. No.: MA-314 board; 1,000 series –

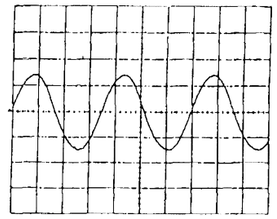
MA-314 BOARD(5/8)





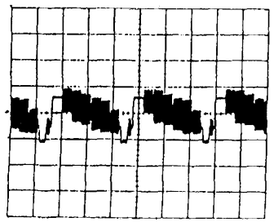
• Waveforms

❶ IC660 ⑤ REC/PB



2.6 Vp-p (17.73 MHz)

❷ IC660 ⑯, ⑱ REC/PB



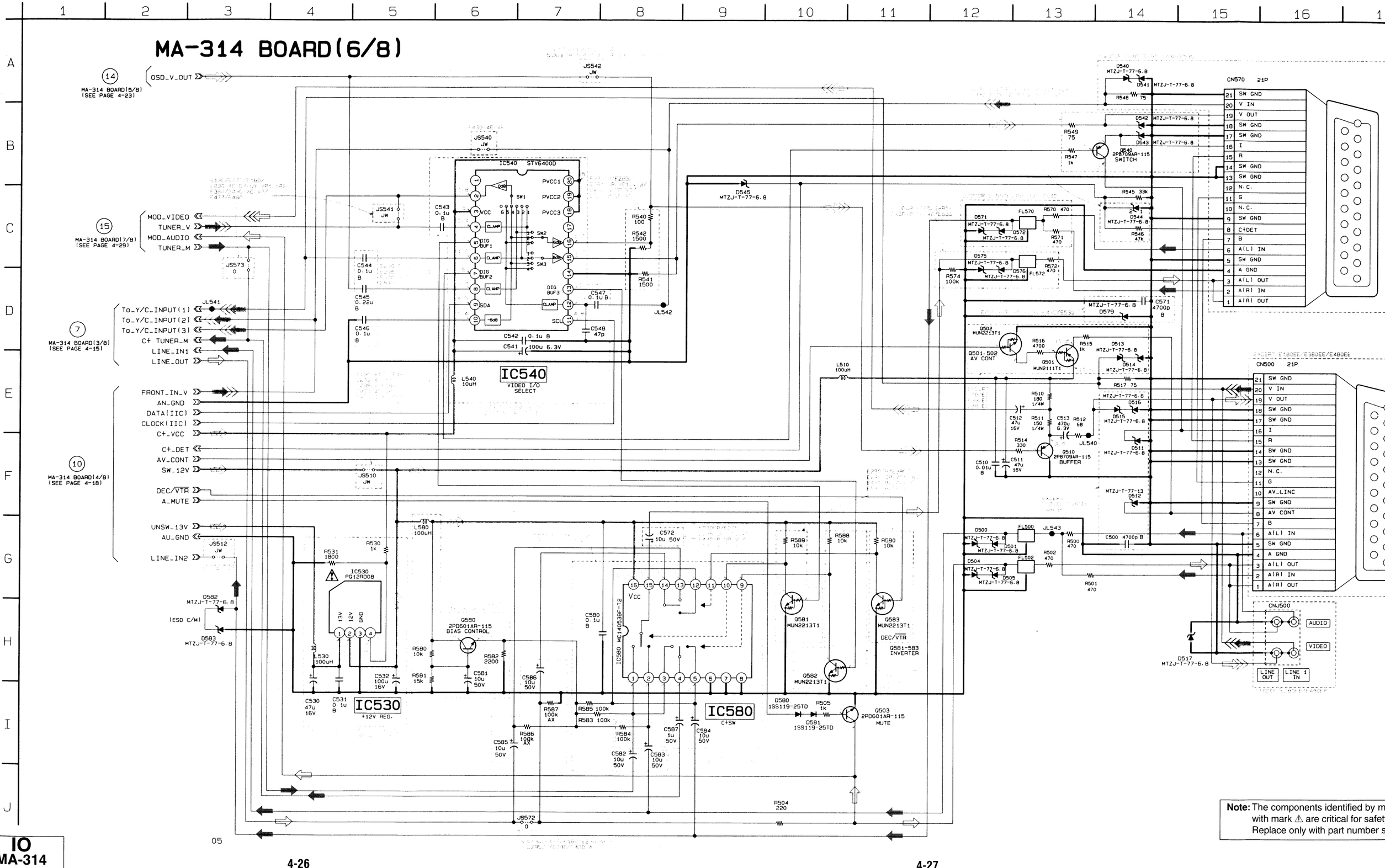
2.1 Vp-p (H)

• Signal path

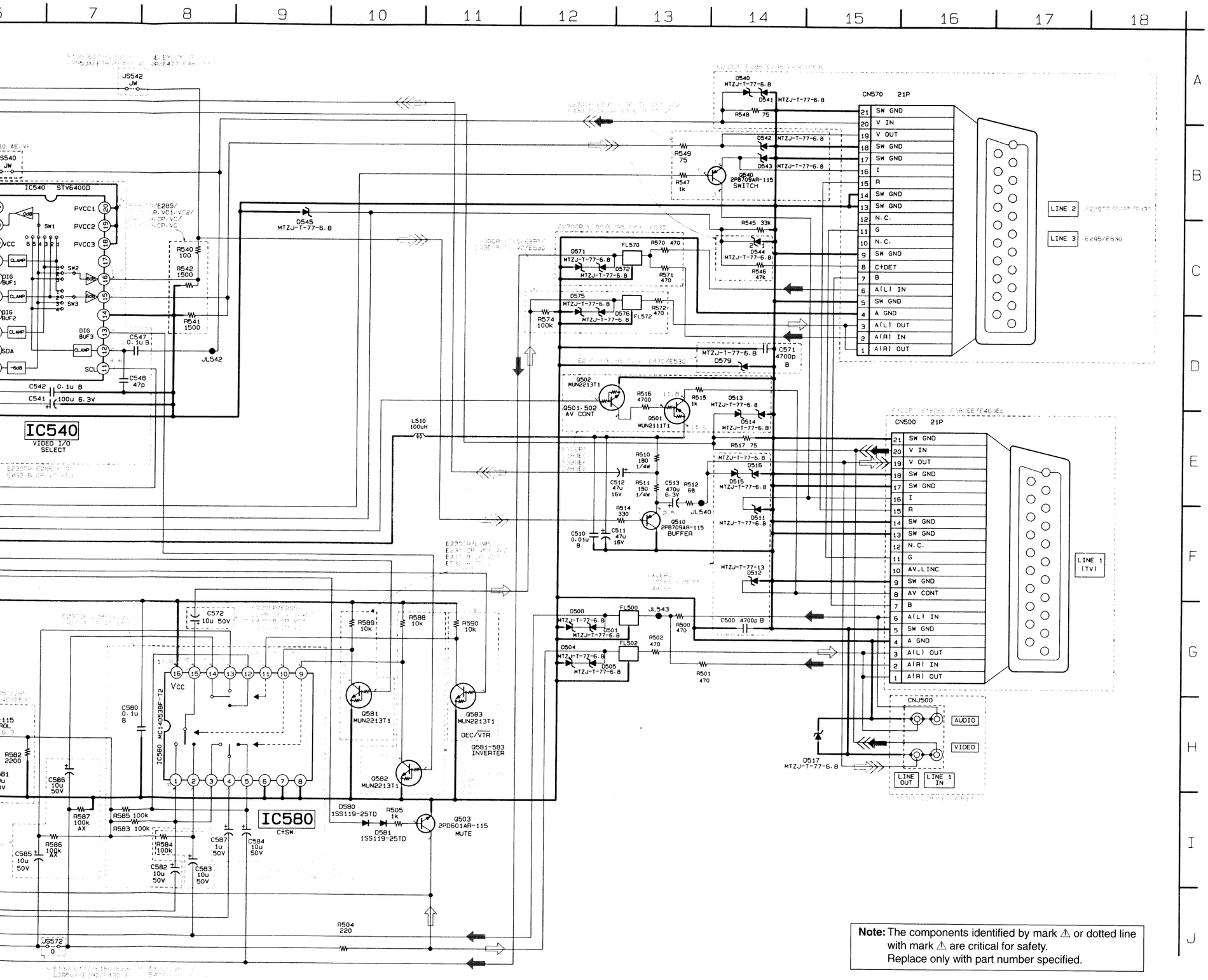
	VIDEO SIGNAL
	Y/CHROMA
REC	➡
PB	⇨

MA-314 (IO) SCHEMATIC DIAGRAM • **See page 4-4 to 4-6 for printed wiring board.**
– Ref. No.: MA-314 board; 1,000 series –

MA-314 BOARD(6/8)



Note: The components identified by mark ⚠ with mark ⚠ are critical for safety. Replace only with part number speci



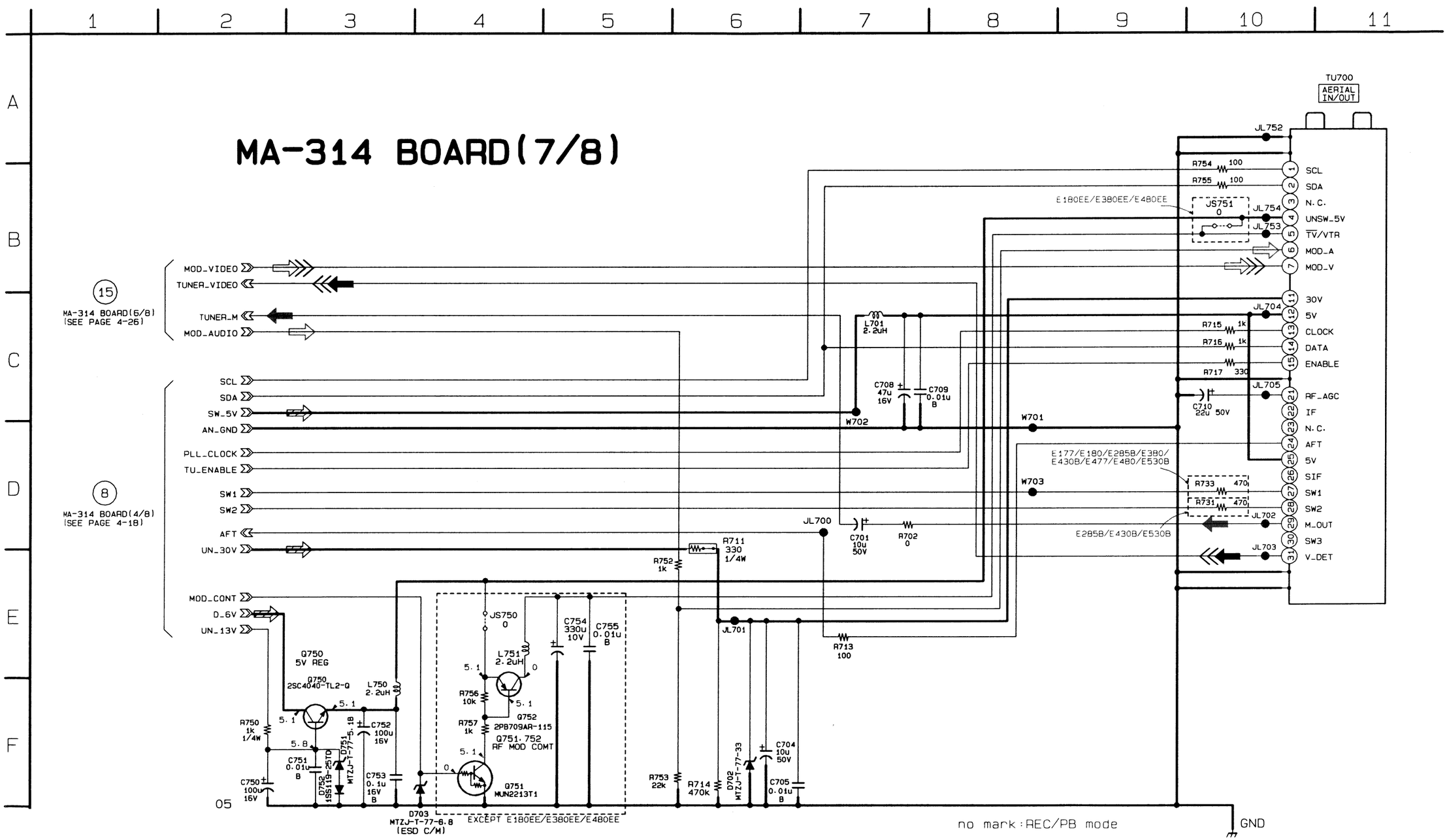
Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

- Signal path

	VIDEO SIGNAL	AUDIO SIGNAL
	Y/CHROMA	
REC		➡
PB		⇨

MA-314 (TUNER) SCHEMATIC DIAGRAM **• See page 4-4 to 4-6 for printed wiring board.**

– Ref. No.: MA-314 board; 1,000 series –

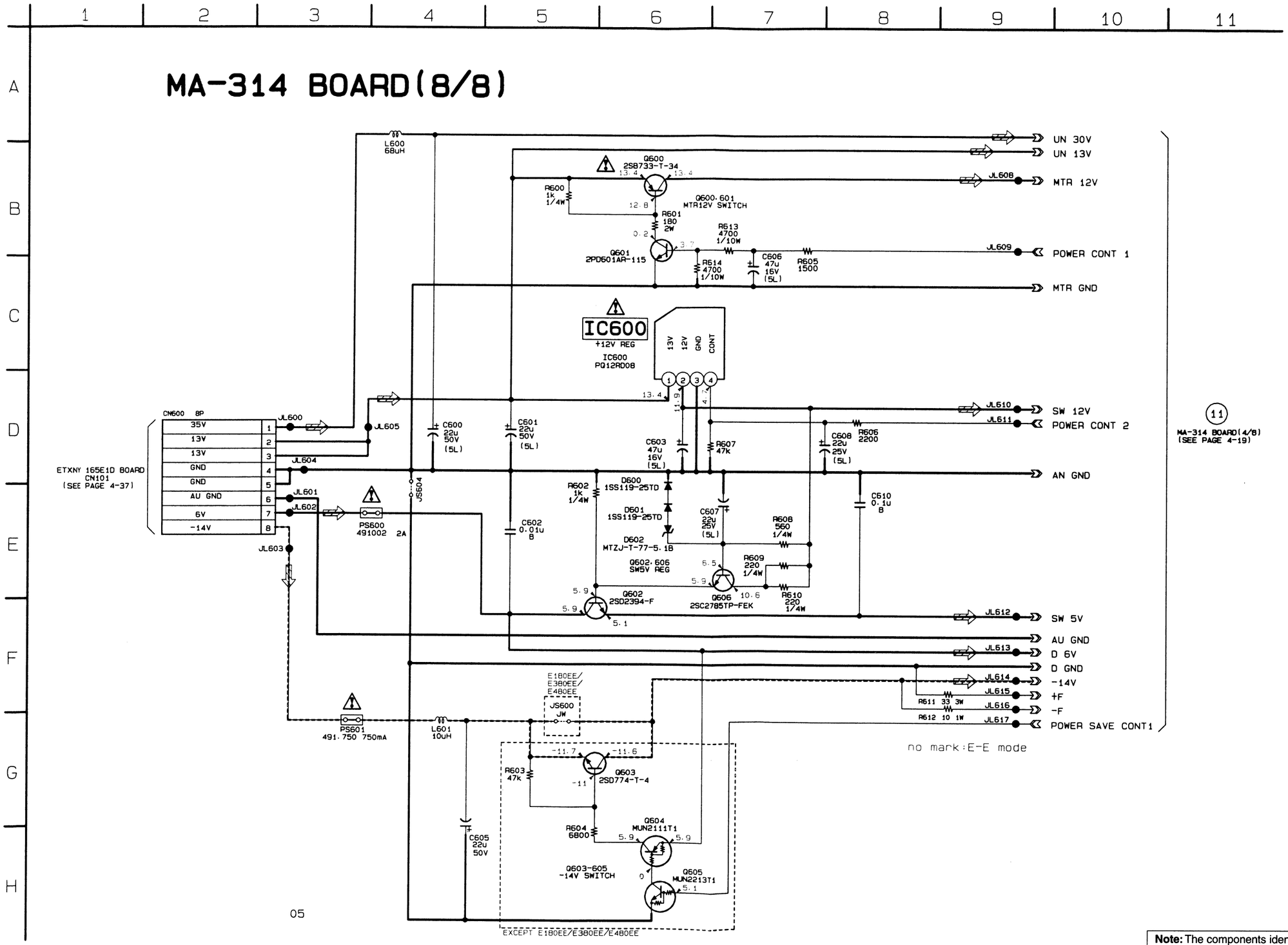


- Signal path

	VIDEO SIGNAL Y/CHROMA	AUDIO SIGNAL
REC	➡	➡
PB	⇨	⇨

MA-314 (POWER SUPPLY) SCHEMATIC DIAGRAM • See page 4-4 to 4-6 for printed wiring board.

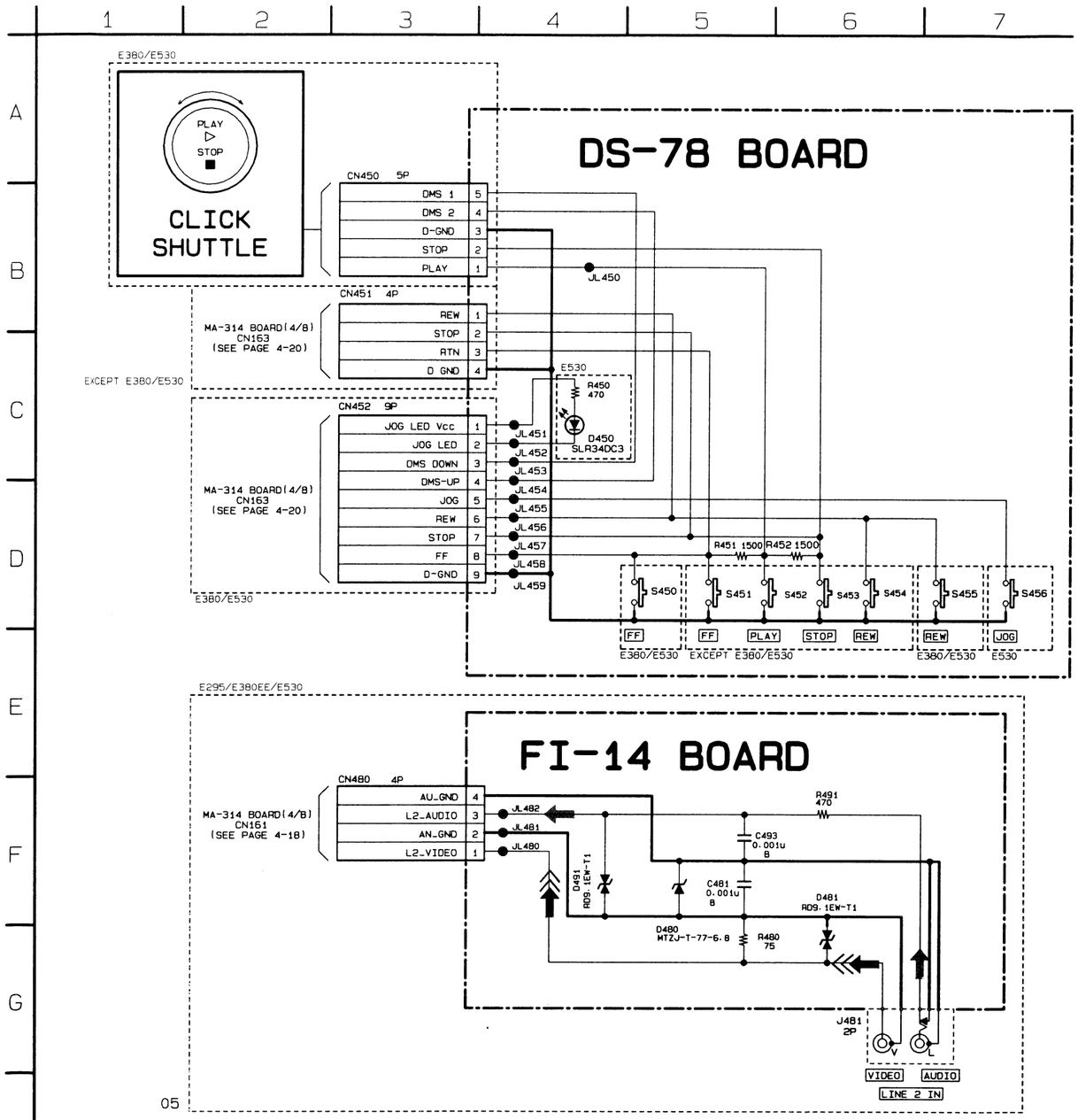
– Ref. No.: MA-314 board; 1,000 series –



Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

DS-78 (MODE CONTROL), FI-14 (FRONT IN) PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAM

– Ref. No.: DS-78 board, FI-14 board; 1,000 series –

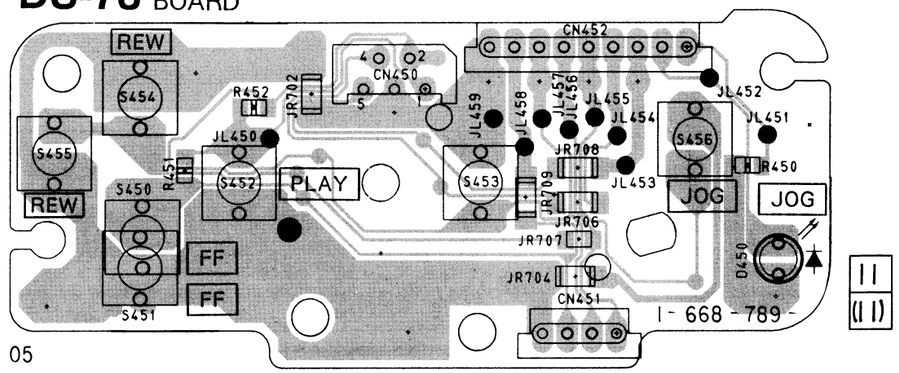


- Signal path

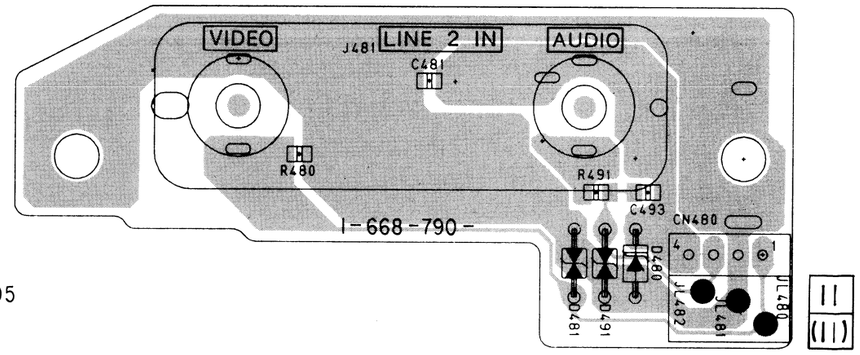
	VIDEO SIGNAL	AUDIO SIGNAL
	Y/CHROMA	
REC	➡	➡
PB	⇨	⇨

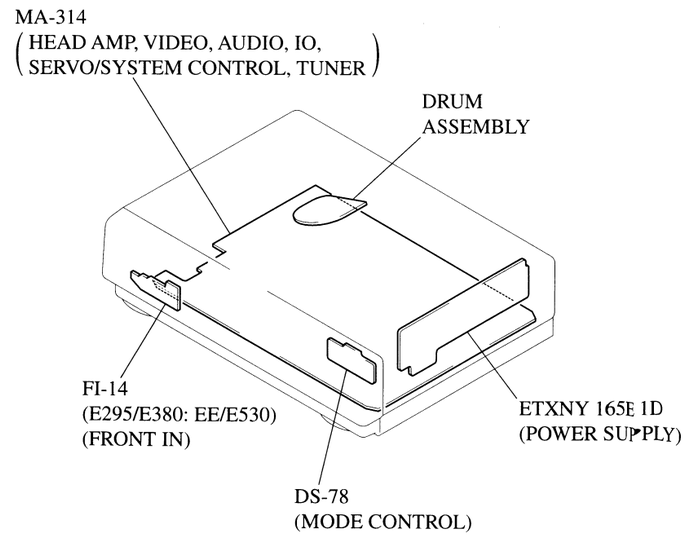
There are few cases that the part isn't mounted in this model is printed on this diagram.

DS-78 BOARD



FI-14 BOARD

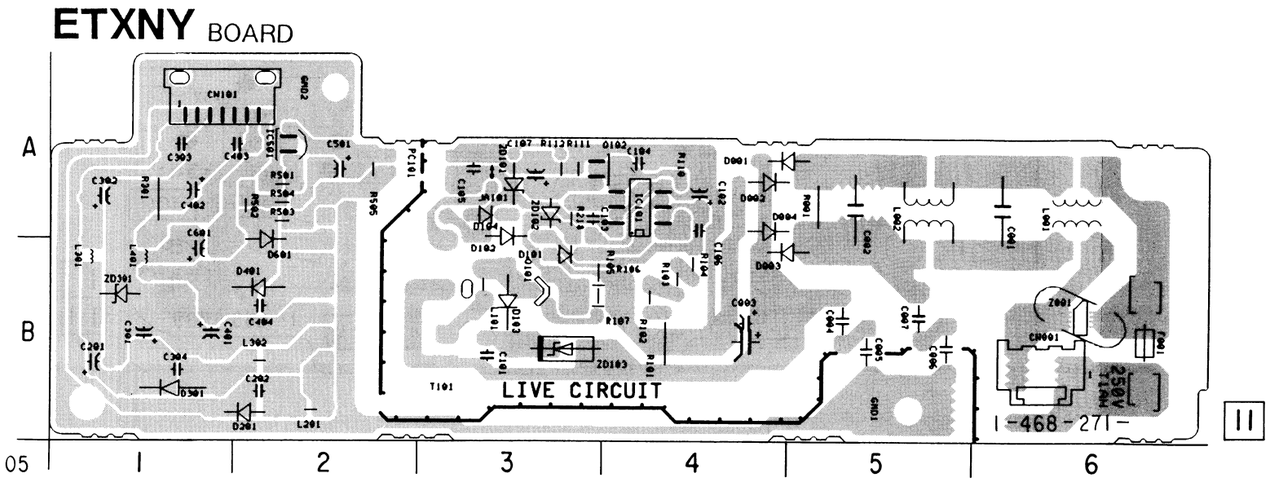




ETXNY 165E1D (POWER SUPPLY) PRINTED WIRING BOARD

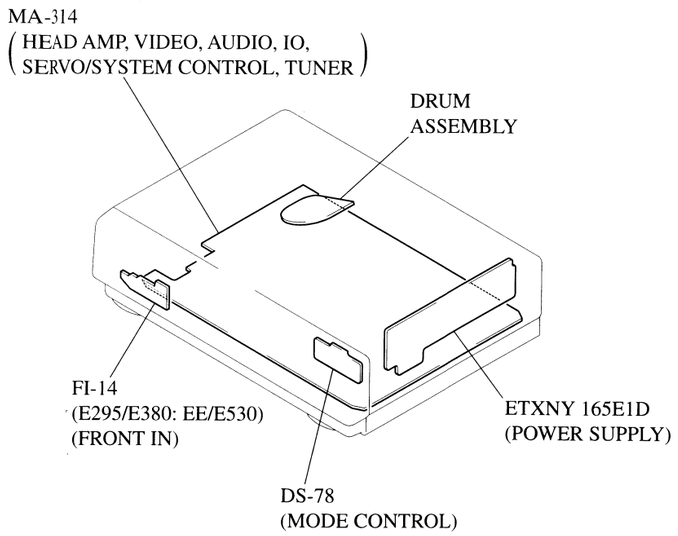
– Ref. No.: ETXNY 165ED board; 2,000 series –

There are few cases that the part isn't mounted in this model is printed on this diagram.



ETXNY 165E1D BOARD

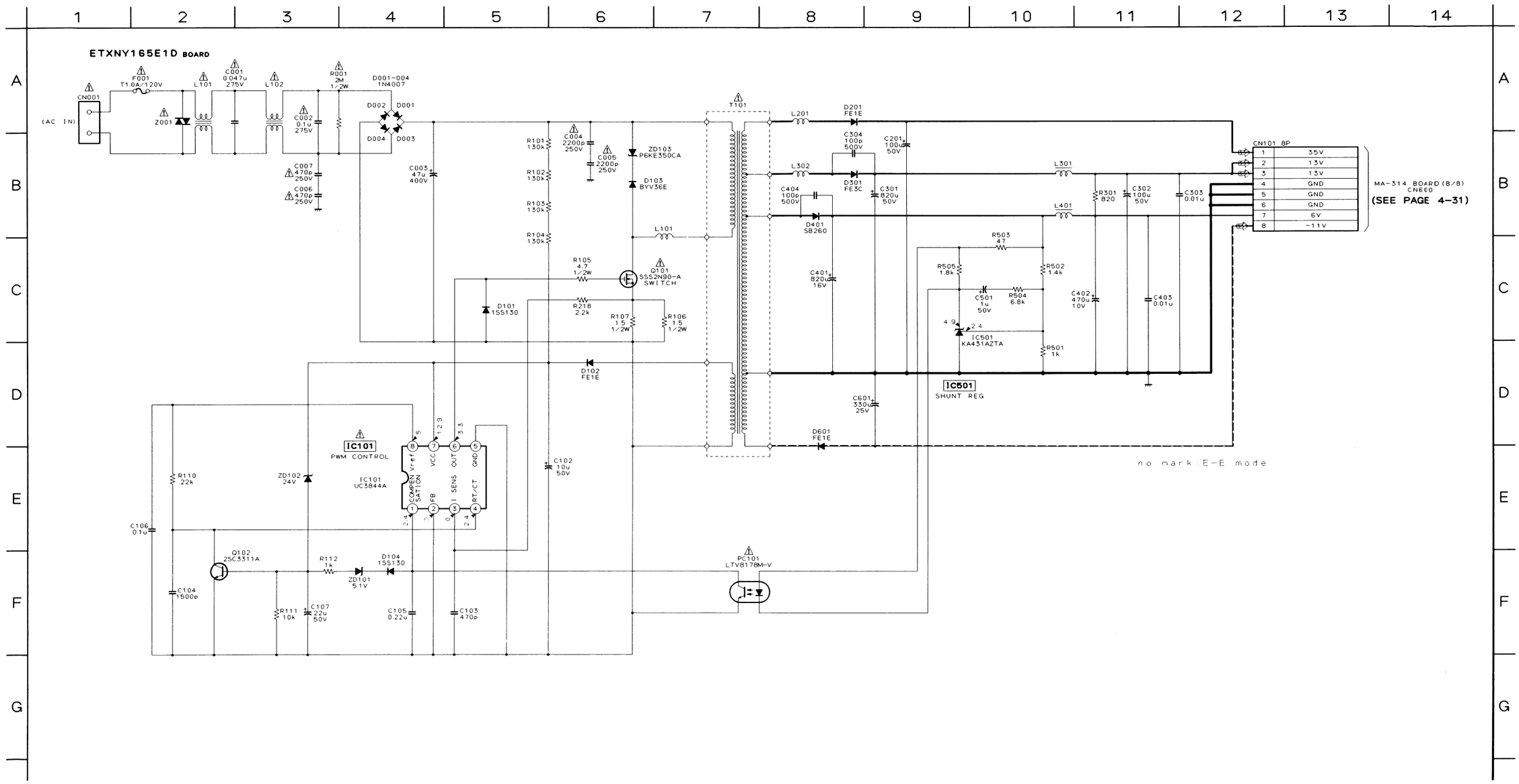
CN001	B-6
CN101	A-1
D001	A-4
D002	A-4
D003	B-4
D004	A-4
D101	B-3
D102	A-3
D103	B-3
D104	A-3
D201	B-2
D301	B-1
D401	B-2
D601	A-2
IC101	A-4
IC501	A-2
Q101	B-3
Q102	A-3
ZD101	A-3
ZD102	A-3
ZD103	B-3



POWER SUPPLY
ETXNY 165E1D

ETXNY 165E1D (POWER SUPPLY) SCHEMATIC DIAGRAM

– Ref. No.: ETXNY 165ED board; 2,000 series –



Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

5-1. SYSTEM CONTROL – VIDEO/RP BLOCK INTERFACE (MA-314 BOARD IC161)

Signal	Pin No.	I/O	STOP/ FF/ REW	TAPE LOADING	TAPE UNLOADING	PB	REC	REC • PAUSE
RF SWP	MA-314 IC161⑱	O	*1	*1	*1	*1	*1	*1
QVD	MA-314 IC161⑬	O	L	L	L	*2	L	L
REC P	MA-314 IC161㊾	O	L	L	L	L	L	H
C SYNC	MA-314 IC161㉞	I	*3	*3	*3	*3	*3	*3

*1. Synchronized with drum rotation. 25 Hz 50% duty pulse.
*2. Normally "L". "H" when videl signal is not generated.
*3. Composite sync signal (positive).

5-2. SYSTEM CONTROL – SERVO PERIPHERAL CIRCUIT INTERFACE (MA-314 BOARD IC161)

Signal	Pin No.	I/O	STOP	FF	REW	TAPE LOADING	TAPE UNLOADING	PB	REC
CTL IN+	MA-314 IC161㉒	O	*7	*7	*7	*7	*7	*7	*1
DRM PG	MA-314 IC161㉘	I	*3	*3	*3	*3	*3	*3	*3
DRM FG	MA-314 IC161㉗	I	*4	*4	*4	*4	*4	*4	*4
CAP FG	MA-314 IC161㉕	I	H/L	*2	*2	*5	*5	*2	*2
CAP RVS	MA-314 IC161⑯	O	H/L	L	H	L	H	L	L
CAP ERR	MA-314 IC161⑰	O	L	*6	*6	*6	*6	*6	*6
DRM ERR	MA-314 IC161㉘	O	*6	*6	*6	*6	*6	*6	*6

*1. 25 Hz pulse.
*2. Pulse of period in proportion to tape speed.
*3. 25 Hz "H" pulse.
*4. 300 Hz pulse.
*5. Unstable period pulse.
*6. DC voltage 1~5V.
*7. Hi-Z (2.5V).

5-3. SYSTEM CONTROL – MECHANISM BLOCK INTERFACE (MA-314 BOARD IC161)

Signal	Pin No.	I/O	EJECTED	CASSETTE LOADING	CASSETTE UNLOADING	TAPE THREAD-ING	TAPE UNTHREAD-ING	STOP	FF	REW	PB	REC
CAM	MA-314 IC161㊽	O	M	H/M	L/M	H/M	L/M	M	M	M	M	M
MODE 1	MA-314 IC161㉙	I	H	–	–	L	L	H	H	H	H	H
MODE 2	MA-314 IC161㉘	I	H	–	–	L	L	H	H	H	L	L
MODE 3	MA-314 IC161㉗	I	L	–	–	H	H	H	L	L	L	L
MODE 4	MA-314 IC161㉖	I	L	–	–	H	H	L	H	H	L	L
REC PRF	MA-314 IC161㉚	I	L	*1	*1	*1	*1	*1	*1	*1	*1	*1
T REEL	MA-314 IC161㉚	I	H/L	H/L	H/L	H/L	H/L	H/L	*2	*2	*2	*2
S REEL	MA-314 IC161㊾	I	H/L	H/L	H/L	*2	*2	H/L	*2	*2	*2	*2
END LED	MA-314 IC161⑳	O	L	*3	*3	*3	*3	*3	*3	*3	*3	*3
T SENS	MA-314 IC161⑦	I	*3	*3	*3	*4	*4	*4	*4	*4	*4	*4
S SENS	MA-314 IC161⑥	I	*3	*3	*3	*4	*4	*4	*4	*4	*4	*4

*1. "L" when erasing protection tab is bent. "H" when not bent.
*2. Pulse of period in proportion to reel rotating speed.
*3. Approx. 2 msec period "H" pulse.
*4. Normally "L" .2 msec period "H" pulse when tape top or tape end is detected.
*5. Hi-Z

5-4. SYSTEM CONTROL – SYSTEM CONTROL PERIPHERAL CIRCUIT INTERFACE (MA-314 BOARD IC161)

Signal	Pin No.	I/O	I/O level
RESET	MA-314 IC161㊸	I	Normally "H", "L" when service interruption is detected or restored.
I2C DATA VIDEO	MA-314 IC161㊷	O	Serial communication data to video microprocessor.
I2C CLOCK VIDEO	MA-314 IC161㊶	O	Serial communication clock with video microprocessor.
PLL DATA I2C DATA 1	MA-314 IC161㉒	O	Serial communication data to audio microprocessor.
I2C CLOCK 1	MA-314 IC161⑰	O	Serial communication clock with audio microprocessor.
(RP) S OUT 1	MA-314 IC161㊺	O	Serial communication data to RP microprocessor.
(RP) S CLK 1	MA-314 IC161㊼	O	Serial communication clock to RP microprocessor.

5-5. SYSTEM CONTROL – AUDIO BLOCK INTERFACE (MA-314 BOARD IC161)

Signal	Pin No.	I/O	STOP/ FF/ REW	TAPE LOADING	TAPE UNLOADING	PB	REC	REC • PAUSE
A MUTE	MA-314 IC161㊽	O	L	L	L	L	L	H

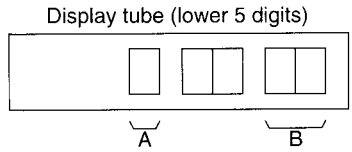
5-6. SERVO/SYSTEM/TIMER/TUNER CONTROL MICROPROCESSOR PIN FUNCTION (MA-314 BOARD IC161)

Pin No.	Pin name	I/O	Function
1	N.C.	–	Not used
2	DEST 0	I	Destination judgement 0
3	TU AFT	I	Tuner analog auto fine tuning input
4	FUNK KEY 2	I	9 KEY input
5	FUNK KEY 1	I	9 KEY input
6	S SENS	I	Tape end sensor input
7	T SENS	I	Tape top sensor input
8	VIDEO RF	I	Video RF input
9	N.C.	–	Not used
10	MOD CONT	O	RF MOD power control
11	N.C.	–	Not used
12	N.C.	–	Not used
13	QVD	O	Quasi VD pulse output
14	REMOCON	I	Remote control signal input
15	SW2	O	Tuner system select
16	CAP RVS	O	Capstan reverse signal output
17	I²C CLOK	O	I²C clock (EEPROM, MOD, MPX, VPS)
18	RF SWP	O	RF switching pulse output
19	N.C.	–	Not used
20	END LED	O	LED output to tape top and tape end sensor
21	AV CONT	O	Euro 21 pin control
22	PLL DATA (I²C DATA 1)	O	Tuner PLL data/I²C data (EEPROM, MOD, MPX, VPS)
23	PLL CLOCK	O	Tuner PLL clock output
24	T ENABLE	O	Tuner enable signal output
25	SW1	O	Tuner system select
26	MODE 4	I	CAM encoder input 4
27	MODE 3	I	CAM encoder input 3
28	MODE 2	I	CAM encoder input 2
29	MODE 1	I	CAM encoder input 1
30	REC PRF	I	Cassette erasing protect tab detect switch input
31	DEST 1	I	Destination judgment 1
32	DEST 2	I	Destination judgment 2
33	DEST 3	I	Destination judgment 3
34	NUB	I	Fixed to GND
35	NUA	I	Fixed to GND
36	CLKSEL	I	Fixed to 5V
37	VCC	–	5V
38	16MHz (in)	I	16MHz
39	16MHz (out)	O	16MHz
40	VSS	–	GND
41	32KHz (in)	I	32KHz
42	32KHz (out)	O	32KHz
43	RESET	I	RESET signal input
44	N.C.	–	Not used
45	$\overline{\text{SECAM ON}}$	O	"L" output when SECAM mode
46	SECAM DET	I	SECAM detect signal input
47	ME SECAM	I	MESECAM judgement input
48	A MUTE	O	Audio mute signal
49	N.C.	–	Not used
50	N.C.	–	Not used

Pin No.	Pin name	I/O	Function
51	I²C CLOCK VIDEO, C+	O	I²C clock (VIDEO, C+)
52	I²C DATA VIDEO, C+	O	I²C data (VIDEO, C+)
53	TA MUTE	O	Tuner audio mute signal output
54	DMS UP	I	Dual mode shuttle control signal input
55	DMS DOWN	I	Dual mode shuttle control signal input
56	DEC/$\overline{\text{VTR}}$	O	Decoder/VTR select
57	SUR ON	O	Surround control
58	CAM	O	CAM motor control
59	N.C.	–	Not used
60	POWER CONT 1	O	MTR 12V control
61	POWER CONT 2	O	SW 12V control
62	POWER SAVE CONT 1	O	–14V control
63	POWER SAVE CONT C+	O	C+ VCC control
64	$\overline{\text{OSD-CS}}$	O	OSD chip select signal output
65	S OUT 1	O	Serial communication signal (RP)
66	$\overline{\text{FLD-CS}}$	O	FL driver chip select signal output
67	S CLK 1	O	Serial communication (RP)
68	S OUT 0	O	Serial communication signal output (FLD, OSD)
69	S IN 0	I	Serial communication signal input (FLD)
70	S CLK 0	O	Serial communication clock output (FLD, OSD)
71	N.C.	–	Not used
72	N.C.	–	Not used
73	N.C.	–	Not used
74	C+DET	I	CANAL + signal input
75	P FAIL	I	Power failure detection input
76	W. ENABLE	O	EEPROM write protect
77	CAP ERR	O	Capstan error output
78	DURM ERR	O	Drum error output
79	S REEL	I	Supply reel sensor input
80	T REEL	I	Take-up reel sensor input
81	PDCDET	I	PDC/VPS receiving signal input
82	CHECK	I	Check signal input
83	N.C.	–	Not used
84	C SYNC	I	Composite sync input
85	CAP FG	I	Capstan FG input
86	DURM PG	I	Drum PG input
87	DURM FG	I	Drum FG input
88	AMP VSS	–	CTL amplifier GND
89	AMP VREF OUT	O	CTL amplifier
90	AMP VPEF IN	I	CTL amplifier
91	CTL IN–	I/O	CTL singal (–) input/output
92	CTL IN+	I/O	CTL singal (+) input/output
93	CTL SW OUT	O	CTL switch output
94	CTL AMP IN	I	CTL amplifier input
95	AMPC	I	CTL amplifier
96	CTL VSS	–	CTL amplifier GND
97	CTL AMP OUT	O	CTL amplifier output
98	AMP VCC	–	CTL amplifier 5V
99	A VCC	–	Analog 5V
100	N.C.	–	Not used

SECTION 6
ERROR CODES

This set displays an error code, and a mode code in case of error on the display tube, if the operation stopped by error.
The following provides description concerned.



A: Error code ..... Table 6-1
B: Mode code in case of error ..... Table 6-2

These codes are displayed at lower 5-digit positions of display tube.
In this case, " : " between digits is not displayed.

Table 6-1. Error Codes

Code	Description
0	NO ERROR
1	CAM ENCODER ERROR, LOAD DIRECTION
2	CAM ENCODER ERROR, UNLOAD DIRECTION
3	T REEL ERROR
4	S REEL ERROR
5	CAPSTAN ERROR
6	DRUM ERROR
7	INITIALIZE ERROR
8	CASSETTE UNLOADING ERROR
9	RESERVED

Table 6-2. Mode Codes in Case of Error

Code	Description
0	POWER-ON EJECT
1	POWER-ON INITIAL
2	POWER-OFF EJECT
3	POWER-OFF STOP
4	FF
5	REW
6	REC
7	REC-PAUSE
8	POWER-ON STOP
9	PB
10	FWD R1
11	FWD R2
12	CUE
13	PB-PAUSE
14	RVS-PAUSE
15	RVS R1
16	RVS R2
17	REV
18	POWER-OFF INITIAL
19	MECHA ERROR (POWER OFF)
20	REW PLAY
21	CAS LOADING
22	TAPE LOADING
23	POWER-OFF LOADING
24	MECHA ERROR (POWER ON)
25	POWER-ON EJECT INITIAL
26	POWER-OFF EJECT INITIAL
27	APC REC
28	CAS LOADING (NO AUTO PB CHECK)

SECTION 7
ADJUSTMENTS

During the adjustment, see the Parts Arrangement Diagram for Adjustment on page 7-6.

7-1. MECHANICAL ADJUSTMENTS

Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENT VI.

7-2. ELECTRICAL ADJUSTMENTS

2-1. PRE-ADJUSTMENT PREPARATIONS

Necessary items and indications for total adjustment of electric circuit of this machine will be described in this chapter.

2-1-1. Instruments to be Used.

1) Color TV
2) Oscilloscope 1or 2 phenomena, band more than 30 MHz, deley mode, as provided.
3) Frequency counter (min. 8 digits)
4) PAL pattern generator
5) Digital voltmeter
6) Audio level meter
7) Audio noise meter
8) Audio generator
9) Modulation Analyzer
10) Distortion factor meter
11) Attenuator
12) Alignmeter tape
    Part Code: 8-192-605-36 (KRV-51P)

2-1-2. Connection

Unless otherwise specified, connect and adjust the measuring instruments as shown in the following diagram.

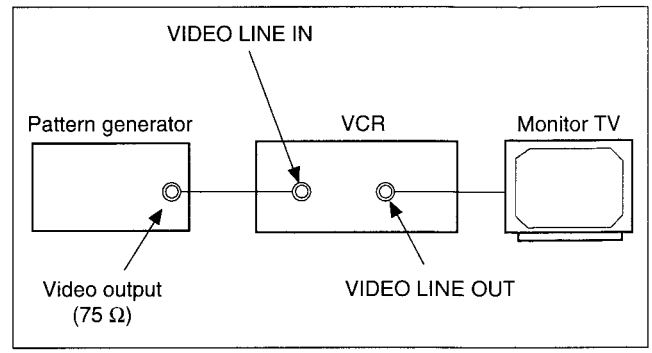


Fig. 7-2-1

2-1-3. Set-up of Adjutment

In this adjustment, PAL pattern generator is connected with LINE input signal terminal. When check to tuner, connected AERIAL terminal. Check that the amplitudes of video signal PAL signal, of picture portions, and of burst signals are flat at approximately 0.3, 0.7 and 0.3 V, respectively, and that the level ratio of the burst signal and "red" signal are 0.30 : 0.66. Fig. 7-2-2. shows video signals (color bars) used in adjusting the video section.

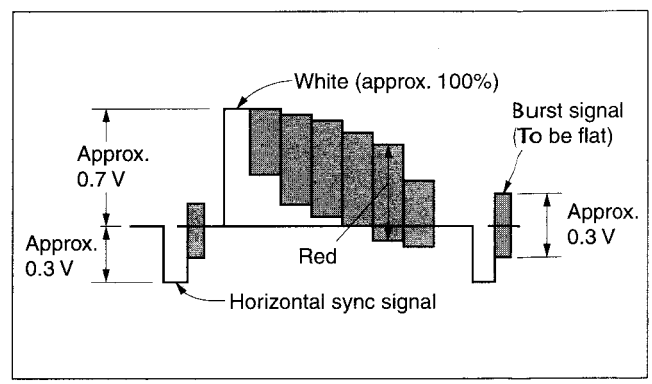


Fig. 7-2-2.

2-1-4. Alignment Tape
[Alignment Tape (KRV-51P)]

	Mode	Time	Video signal	Audio signal (HiFi/Normal)
1	SP	Seven minutes	Color bar	1400 Hz
2		Three minutes	Monoscope	1400 Hz
3	EP	Seven minutes	Color bar	1400 Hz
4		Three minutes	Monoscope	1400 Hz

2-1-5. Specified I/O Level and Impedance

Input/output terminal

Video inputs
LINE IN : phono jacks
EURO-AV : 21-pin (Pin ⑳) 1 Vp-p, 75 Ω, unbalanced, sync nagative

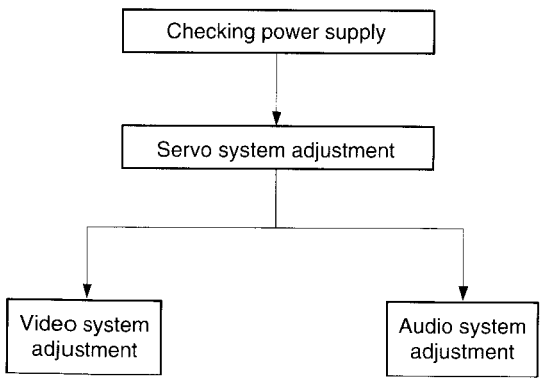
Audio inputs
LINE IN : phono jack
47 kW, –75 dBs (0 dBs = 0.775 Vrms)
EURO-AV : 21-pin (Pin ② and ⑥)
More than 10 kΩ, –4 dBs

Video outputs
LINE OUT : phono jack
EURO-AV : 21-pin (Pin ⑲) 1 Vp-p, 75 Ω, unbalanced, sync negative

Audio outputs
LINE OUT : phono jacks
–7.5 dBs at load
impedance 47 kΩ
Output impedance : less than 10 kΩ
EURO-AV : 21-pin (Pin ① and ③)
Output impedance : less than 1 kΩ
–4 dBs with 10 kΩ load

2-1-6. Adjusting Sequence

Make the electrical adjustment in the following sequence.



2-2. POWER SUPPLY ADJUSTMENT

2-2-1. Power Supply Check

Mode	E-E
Measuring Instrument	Digital voltmeter
–11.5 V check	
Measurement Point	Pin ⑧ of CN600 (MA-314 board)
Specified Value	11.4 $^{+1.2}_{-0.5}$ V
D6 V check	
Measurement Point	Pin ⑦ of CN600 (MA-314 board)
Specified Value	5.9 ± 0.2 V
+13 V check	
Measurement Point	Pin ②, ③ of CN600 (MA-314 board)
Specified Value	13.75 ± 0.55 V
+35 V check	
Measurement Point	Pin ① of CN600 (MA-314 board)
Specified Value	35 ± 3.5 V

Checking Method:

1) Confirm that each voltage meets its specified value.

2-3. SERVO SYSTEM Adjustment

2-3-1. RF Switching Position Adjustment (MA-314 Board)

Purpose:

Adjust the interval between A ch and B ch of tape playback output.

Improve the interchangeability with other tapes and sets.

When it is out of order, the interval appears on the screen, the screen is disturbed.

Mode	PB
Signal	Alignment tape SP mode color bar
Measurement Point	CH1: VIDEO LINE OUT CH2: Pin ② of CN262 (RF SWP)
Measuring Instrument	Oscilloscope
Specified Value	6.5 ± 0.5 H (416 ± 32 µsec)

Adjusting Method:

1) Connect MA-314 board Pin ⑤ of CN262 to the GND for about 1 secont to activate the RF switching position adjustment mode.
2) Check appear "A P" on FL display.
3) Using the channel + and – buttons, adjust to 416 ± 32 µsec (6.5 ± 0.5 H).
4) Press the pause button.

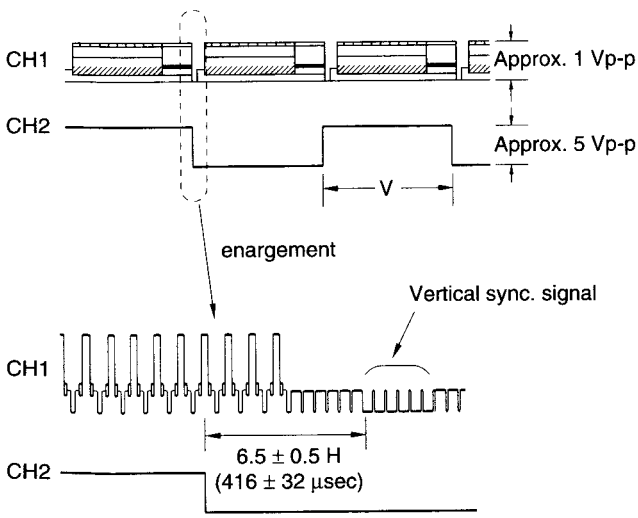


Fig. 7-2-3.

2-4. VIDEO SYSTEM ADJUSTMENT

Adjust the video system in the following sequence as a rule. The color video signal supplied from the pattern generator is used as a video input signal for video system adjustment in the recording mode.

Make sure that sync. and color burst signals meet requirements specified at set up of adjustment shown in Fig. 7-2-1.

[Adjustment Sequence]

2-4-1. Playback Y Signal Level Check
2-4-2. Recording Chroma Level Check
2-4-3. Sync. AGC Check
2-4-4. X'tal Oscillation Frequency Check

2-4-1. Playback Y Signal Level Check (MA-314 Board)

Purpose:

Confirm that the playback Y signal level is correct.

Mode	PB
Signal	Alignment tape SP color bar
Measurement point	Pin ㊳ IC201
Measurement equipment	Oscilloscope
Specified value	2.10 ± 0.18 Vp-p

Confirmation Method:

1) Confirm that the play Y level is 2.10 ± 0.18 Vp-p.

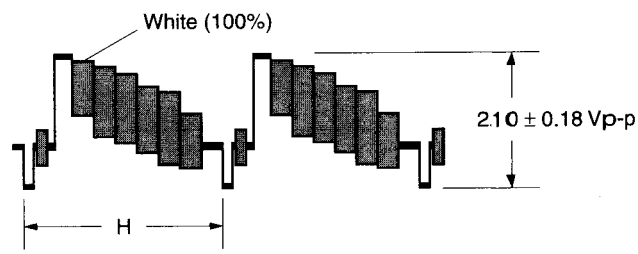


Fig. 7-2-4.

2-4-2. Recording Chroma Level Check (MA-314 Board)

Purpose:

Check the chroma signal level after passing through the Y/C separating circuit.

If shifted, the image is roughened and another color may appear on the edges.

Mode	E-E
Signal	Color bar
Measurement point	Pin ⑭ of IC201
Measurement equipment	Oscilloscope
Specified value	500 ± 80 mVp-p

Confirmation Method:

1) Confirm that the record chroma level is 500 ± 80 mVp-p.

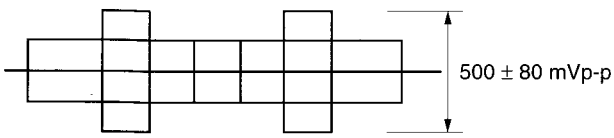


Fig. 7-2-5.

2-4-3. Sync. AGC Check (MA-314 Board)

Purpose:

Confirm that the video level is correct.

Mode	E-E
Signal	Color bar
Measurement point	Pin ㊳ IC201
Measurement equipment	Oscilloscope
Specified value	2.10 ± 0.14 Vp-p

Note: Video output terminal must be terminated at 75 Ω.

Confirmation Method:

1) Confirm that the sync. AGC level is 2.10 ± 0.14 Vp-p.

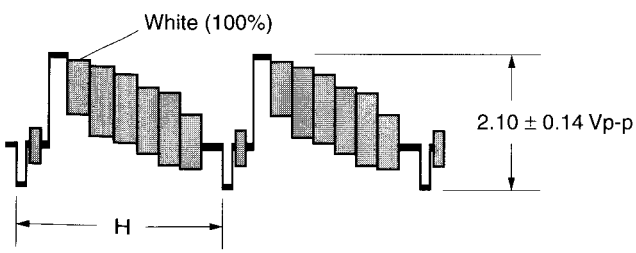


Fig. 7-2-6.

2-4-4. X'tal Oscillation Frequency Check (MA-314)

Purpose:

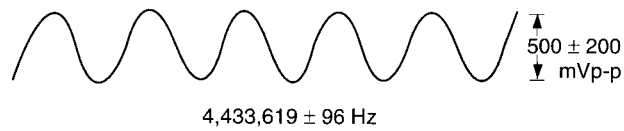
Confirm that the fsc is correct.

Mode	PB
Signal	Alignment tape SP color bar
Measurement point	Pin ㊾ of IC201
Measurement equipment	Frequency counter, Oscilloscope
Specified value	4,433,619 ± 96 Hz

Note: Connect the frequency counter through a probe of high input impedance (about 10 MΩ) and low capacity (10 pF or less).

Confirmation Method:

1) Confirm that the frequency is 4,433,619 ± 96 Hz
2) Confirm that the amplitude is 500 ± 200 mVp-p.



4,433,619 ± 96 Hz

Fig. 7-2-7.

2-5. AUDIO SYSTEM ADJUSTMENTS

- Adjust both Lch and Rch.

[Connection]

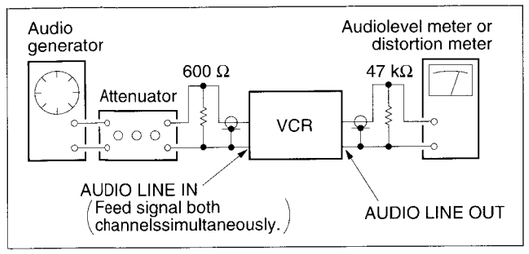


Fig. 7-2-8.

2-5-1. Normal Audio System Adjustment

- Make adjustment in the SP mode, unless otherwise specified. Use a normal VHS cassette for an adjustment tape.
- Set AUDIO MONITOR to normal.

[Adjustment Sequence]

1. **ACE Head Adjustment**
2. **E-E Output Level Check**
3. **Frequency Responce Check**
4. **Overall Level Characteristic and Distortion Factor Check**
5. **Overall S/N Check**

1. ACE Head Adjustment
Refer to the service manual of VHS MECHANICAL ADJUSTMENT IV.

2. E-E Output Level Check

Purpose:
Confirm that the output level against the reference input is within the specification.

Mode	E-E
Signal	L, R: 400 Hz, –6.3 dBs
Measurement point	Audio output terminal
Measurement equipment	Audio level meter
Specified value	–6.3 ± 2 dBs

Confirmation Method:
1) Simultaneously input a signal of 400 Hz, –6.3 dBs to both L and R channels of Audio Line Input.
2) Confirm that the audio output level is –6.3 ± 2 dBs.

3. Frequency Responce Check

Purpose:
Confirm that the frequency characteristic is within the specification.

Mode	REC and PB (SP mode)
Signal	400 Hz, –26.3 dBs 7 kHz, –26.3 dBs
Measurement point	Audio output terminal
Measurement equipment	Audio level meter
Specified value	0 ± 3 dB

Tape path adjustment must have been completed.

Confirmation Method:
1) Supply a signal of 400 Hz, –26.3 dBs to both L and R channels of Audio Line Input.
2) Connect the audio level meter to the Audio Line Output.
3) Adjust the attenuator so that the audio level meter will indicate –26.3 dBs.
4) Make recording in the SP mode.
5) Set an audio line input signal to 7 kHz and make recording.
6) Playback a recorded portion, and measure output levels at 400 Hz and 7 kHz.
7) Confirm that the 7 kHz playback output level within a range of the 400 Hz playback output level 0 ± 3 dB.

4. Overall Level Characteristic and Distortion Factor Check

Purpose:
Check the record level, play level, and distortion factor against the reference input.

Mode	REC and PB (SP mode)
Signal	400 Hz, –6.3 dBs
Measurement point	Audio output terminal
Measurement equipment	Audio level meter and distortion factor meter
Specified value	Playback level: –6.3 ± 3 dBs Distortion factor: 4% or less

Confirmation Method:
1) Supply an audio signal of 400 Hz, –6.3 dBs simultaneously to both L and R channels of Audio Line Input.
2) Make recording
3) Play back a recorded portion.
4) Confirm that a playback level is –6.3 ± 3 dBs.
5) Confirm that a distortion factor is within 4%.

5. Overall S/N Check

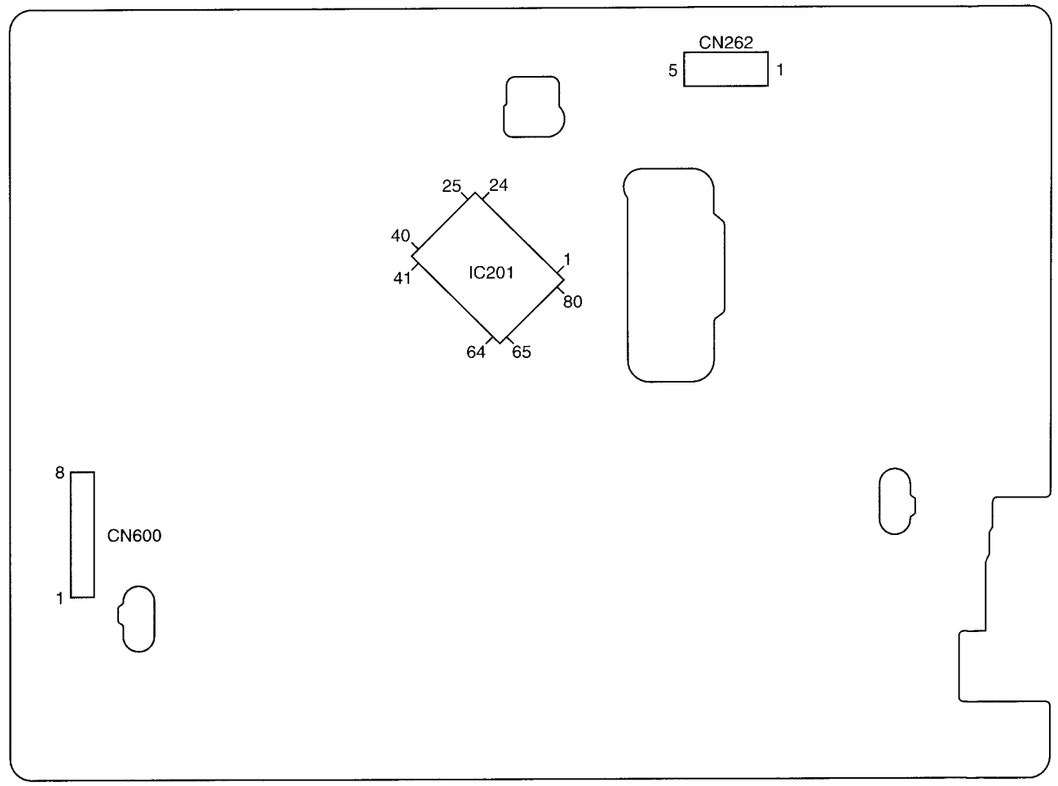
Purpose:
Confirm that the S/N is within the specification.

Mode	REC and PB (SP mode)
Signal	Short
Measurement point	Audio output terminal
Measurement equipment	Audio noise meter
Specified value	–38.0 dBs or less

Confirmation Method:
1) Connect both L and R channels of audio line input to the GND.
2) Start recording.
3) Play the recorded part to confirm that the noise is below –38.0 dBs.

2-6. PARTS ARRANGEMENT DIAGRAM FOR ADJUSTMENTS

MA-314 BOARD (Side B)



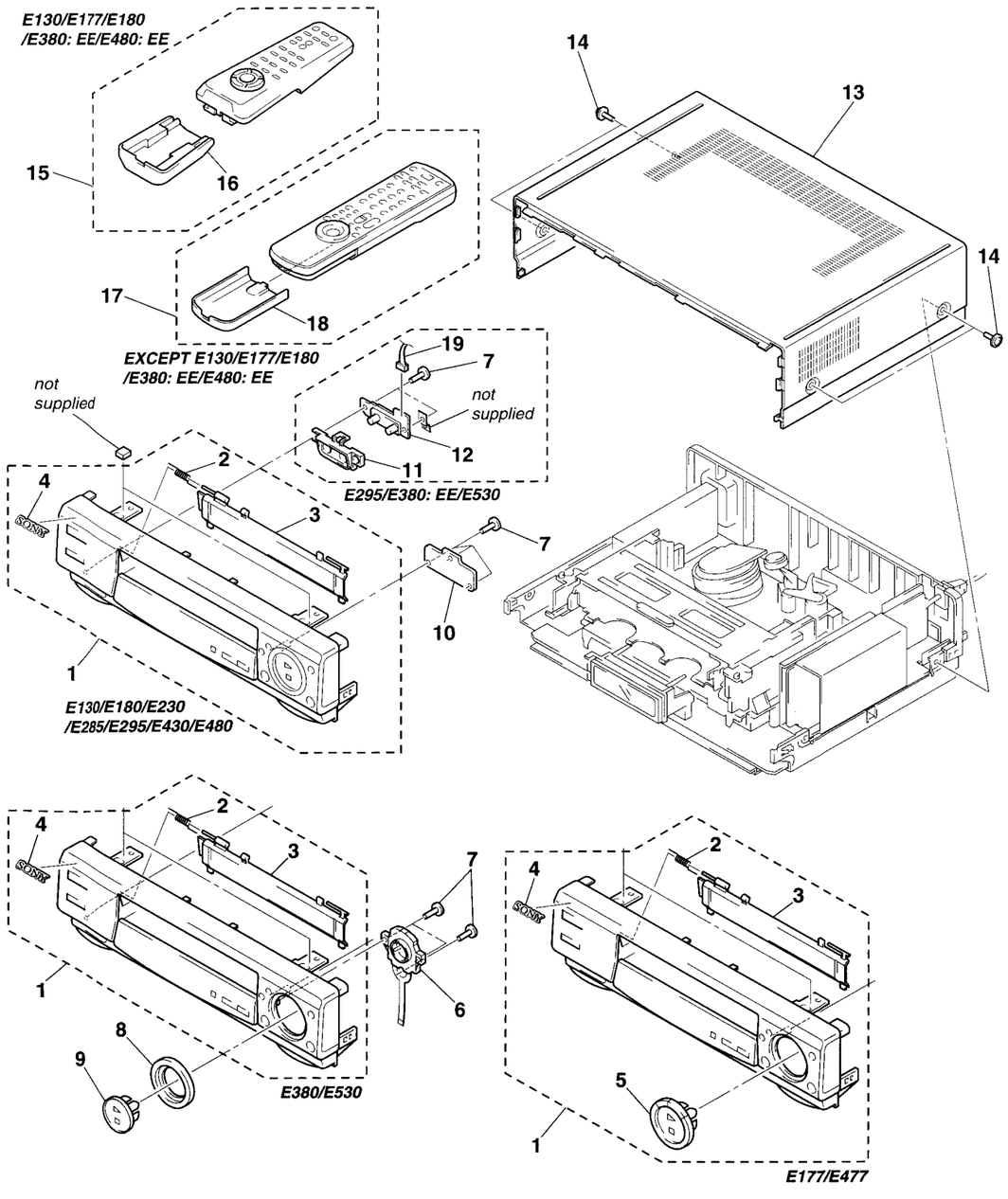
SECTION 8
REPAIR PARTS LIST

8-1. EXPLODED VIEWS

NOTE:
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Color Indication of Appearance Parts
  Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ Parts Color ↑ Cabinet's Color
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of the electrical parts list.

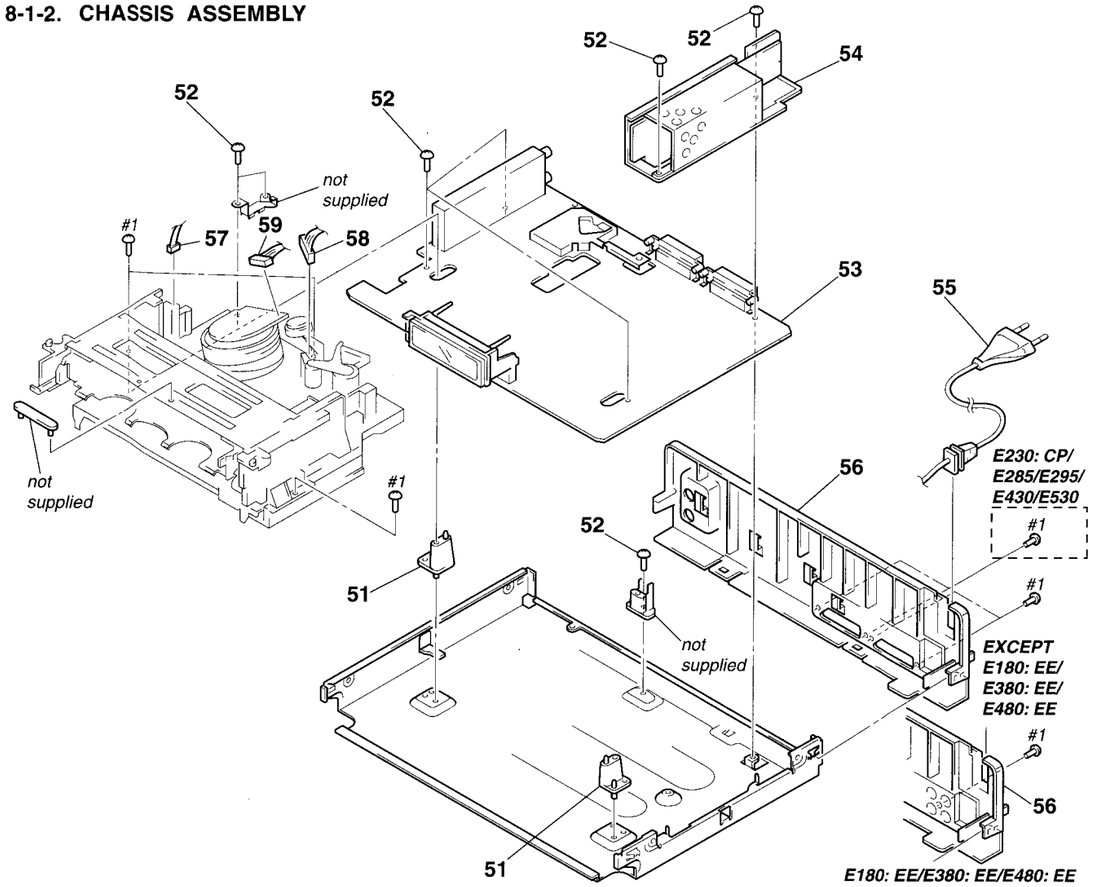
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

8-1-1. FRONT PANEL AND CABINET ASSEMBLIES



Ref. No.	Part No.	Description	Remark
1	X-3948-017-1	PANEL ASSY, FRONT (E530: UX)	
1	X-3948-018-1	PANEL ASSY, FRONT (E530: VC)	
1	X-3948-019-1	PANEL ASSY, FRONT (E530: B)	
1	X-3948-020-1	PANEL ASSY, FRONT (E530: CP)	
1	X-3948-022-1	PANEL ASSY, FRONT (E430: VC, VP)	
1	X-3948-023-1	PANEL ASSY, FRONT (E430: B)	
1	X-3948-024-1	PANEL ASSY, FRONT (E430: AE, CP)	
1	X-3948-025-1	PANEL ASSY, FRONT (E295: UX)	
1	X-3948-026-1	PANEL ASSY, FRONT (E295: CP)	
1	X-3948-027-1	PANEL ASSY, FRONT (E285: B)	
1	X-3948-028-1	PANEL ASSY, FRONT (E230: EY, UY)	
1	X-3948-029-1	PANEL ASSY, FRONT (E230: AE, CP)	
1	X-3948-030-1	PANEL ASSY, FRONT (E130)	
1	X-3948-031-1	PANEL ASSY, FRONT (E480: EG)	
1	X-3948-032-1	PANEL ASSY, FRONT (E380: EG)	
1	X-3948-033-1	PANEL ASSY, FRONT (E180)	
1	X-3948-034-1	PANEL ASSY, FRONT (E480: EE)	
1	X-3948-035-1	PANEL ASSY, FRONT (E380: EE)	
1	X-3948-039-1	PANEL ASSY, FRONT (E295: VC1, VC2)	
1	X-3948-040-1	PANEL ASSY, FRONT (E285: VC)	
1	X-3948-041-1	PANEL ASSY, FRONT (E230: VP1, VP2)	
1	X-3948-042-1	PANEL ASSY, FRONT (E477)	
1	X-3948-043-1	PANEL ASSY, FRONT (E177)	
2	3-953-432-01	SPRING (GE), FL	
3	3-979-467-01	DOOR, CASSETTE (EXCEPT E177/E477)	
3	3-979-467-11	DOOR, CASSETTE (E177/E477)	
4	3-943-995-01	EMBLEM (NO.5), SONY	
5	X-3946-598-1	BUTTON ASSY, FUNCTION (E177/E477)	
6	1-762-844-21	SWITCH, ROTARY (E380/E530)	
7	4-921-277-41	SCREW (B2.6X8), TAPPING, BIND	
8	3-973-077-11	RING, CHANGE SPEED (E380/E530)	
9	3-972-782-11	BUTTON, CENTER (E380/E530: CP, UX, VC)	
9	3-972-782-41	BUTTON, CENTER (E530: B)	
* 10	A-6794-505-A	DS-78 BOARD, COMPLETE (EXCEPT E380/E530)	
* 10	A-6794-517-A	DS-78 BOARD, COMPLETE (E530)	
* 10	A-6794-518-A	DS-78 BOARD, COMPLETE (E380)	
11	3-979-477-11	COVER, JACK (E295/E380: EE/E530)	
* 12	A-6794-507-A	FI-14 BOARD, COMPLETE (E295/E380: EE/E530)	
* 13	3-979-384-01	CASE, UPPER (E) (EXCEPT E177/E477)	
* 13	3-979-384-11	CASE (E), UPPER (E177/E477)	
14	3-710-901-11	SCREW (TP3X8), CASE	
15	1-475-565-11	COMMANDER, STANDARD (RMT-V220) (E130/E177/E180/E380: EE)	
15	1-475-565-31	COMMANDER, STANDARD (RMT-V220B) (E480: EE)	
16	3-709-322-01	COVER, BATTERY (for RMT-V220/V220B) (E130/E177/E180/E380: EE/E480: EE)	
17	1-475-566-11	COMMANDER, STANDARD (RMT-V221) (E230: AE, CP, VP1, VP2/E285: VC/E380: EG)	
17	1-475-566-21	COMMANDER, STANDARD (RMT-V221A) (E230: EY, UY)	
17	1-475-566-31	COMMANDER, STANDARD (RMT-V221B) (E285: B)	
17	1-475-566-41	COMMANDER, STANDARD (RMT-V221C) (E430: B)	
17	1-475-566-51	COMMANDER, STANDARD (RMT-V221D) (E477)	
17	1-475-566-61	COMMANDER, STANDARD (RMT-V221E) (E430: AE, CP, VC, VP/E480: EG)	
17	1-475-567-11	COMMANDER, STANDARD (RMT-V222) (E295: CP, VC1, VC2/E530: CP, VC)	
17	1-475-567-21	COMMANDER, STANDARD (RMT-V222A) (E295: UX/E530: UX)	
17	1-475-567-31	COMMANDER, STANDARD (RMT-V222B) (E530: B)	
18	3-709-128-01	COVER, BATTERY (for EXCEPT RMT-V220 /V220B) (E230/E285/E295/E380: EG/ E430/E477/E480: EG/E530)	
19	1-958-318-11	HARNES (FR-64) (E295/E380/E530)	

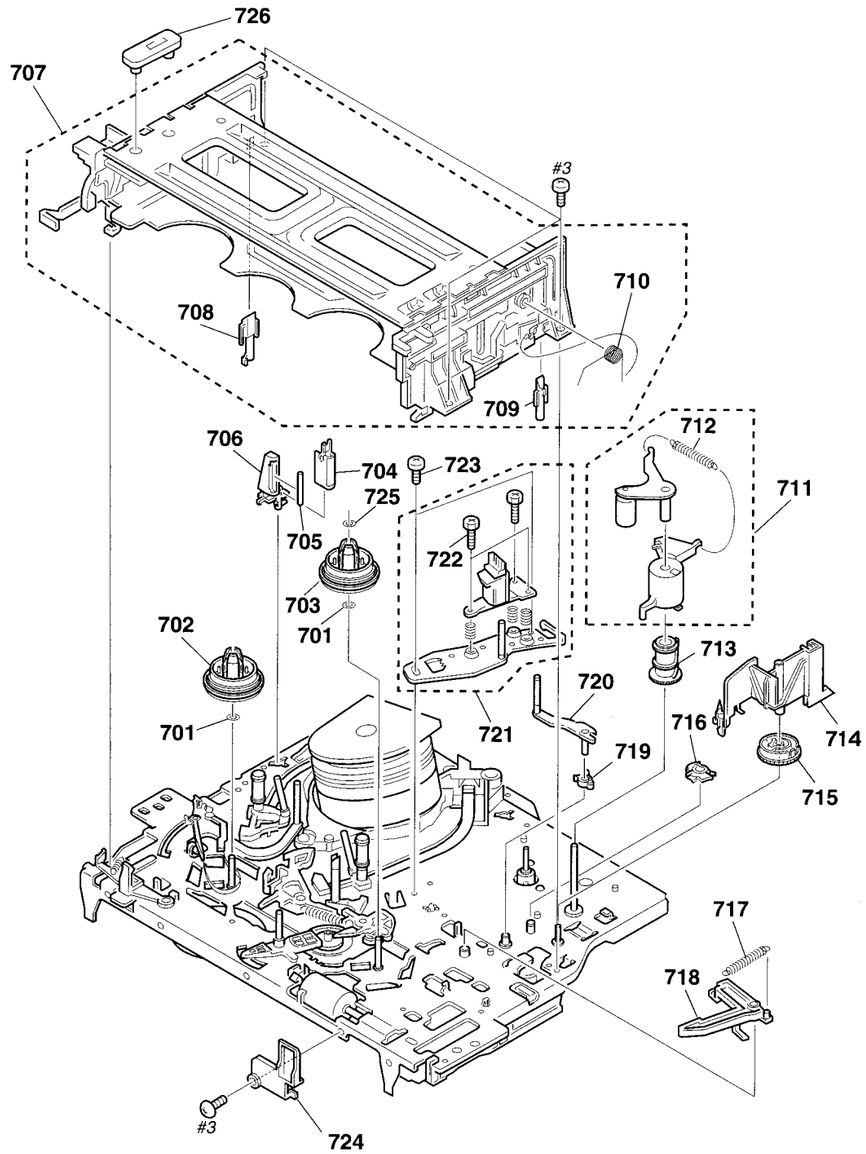
8-1-2. CHASSIS ASSEMBLY



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

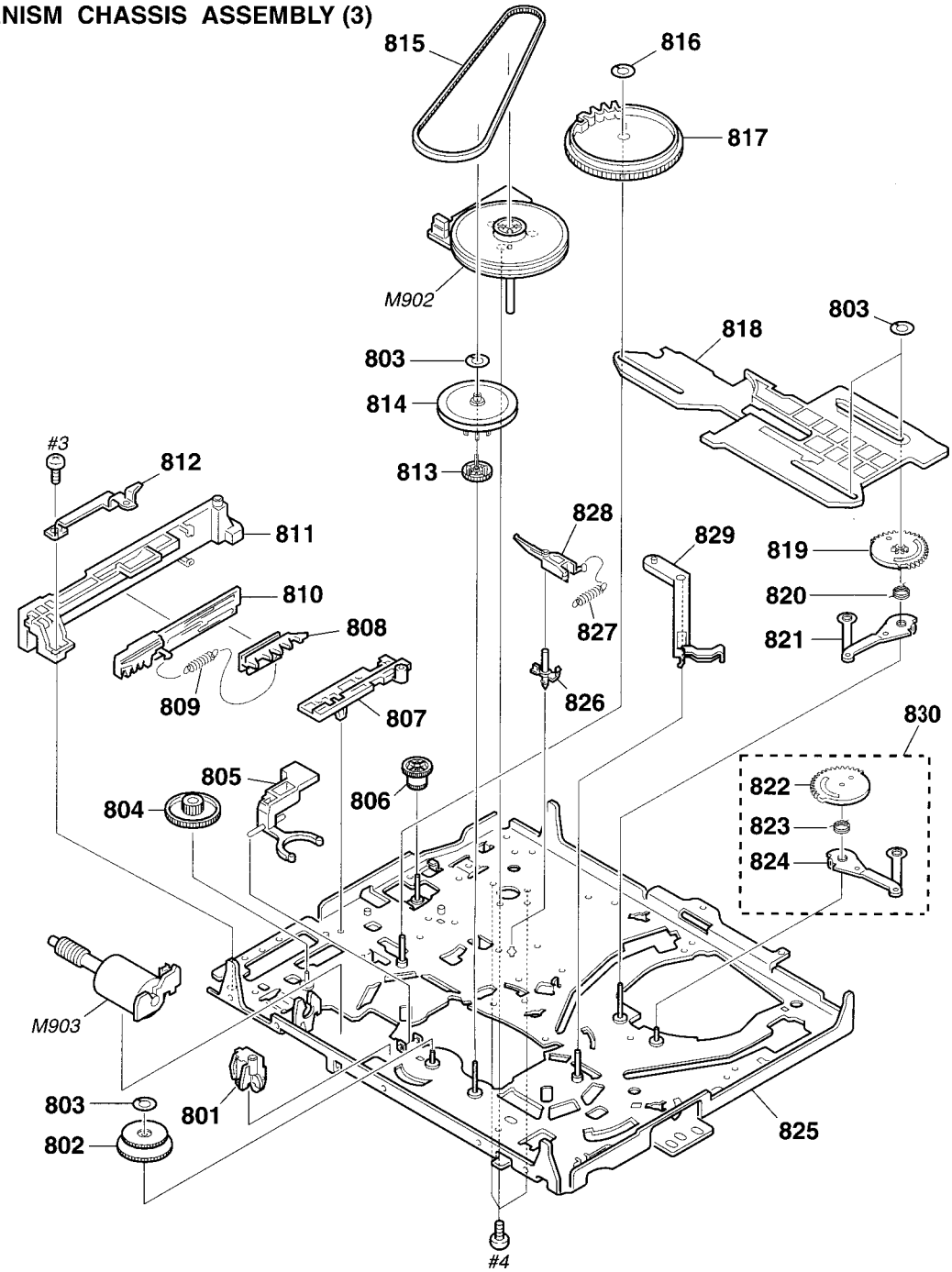
Ref. No.	Part No.	Description	Remark
51	3-959-383-01	BASE (R), MD	
52	3-970-608-21	SUMITITE (B3), +BV	
* 53	A-6791-440-A	MA-314 BOARD, COMPLETE (E230: UY)	
* 53	A-6791-441-A	MA-314 BOARD, COMPLETE (E230: VP1, VP2)	
* 53	A-6791-442-A	MA-314 BOARD, COMPLETE (E285: VC)	
* 53	A-6791-443-A	MA-314 BOARD, COMPLETE (E295: UX)	
* 53	A-6791-444-A	MA-314 BOARD, COMPLETE (E295: VC1, VC2)	
* 53	A-6791-474-A	MA-314 BOARD, COMPLETE (E230: AE)	
* 53	A-6791-475-A	MA-314 BOARD, COMPLETE (E230: CP)	
* 53	A-6791-476-A	MA-314 BOARD, COMPLETE (E285: B)	
* 53	A-6791-477-A	MA-314 BOARD, COMPLETE (E230: EY)	
* 53	A-6791-478-A	MA-314 BOARD, COMPLETE (E130)	
* 53	A-6791-479-A	MA-314 BOARD, COMPLETE (E295: CP)	
* 53	A-6791-508-A	MA-314 BOARD, COMPLETE (E530: UX)	
* 53	A-6791-509-A	MA-314 BOARD, COMPLETE (E530: CP)	
* 53	A-6791-510-A	MA-314 BOARD, COMPLETE (E430: AE)	
* 53	A-6791-511-A	MA-314 BOARD, COMPLETE (E430: VP)	
* 53	A-6791-512-A	MA-314 BOARD, COMPLETE (E530: B)	
* 53	A-6791-513-A	MA-314 BOARD, COMPLETE (E430: CP)	
* 53	A-6791-514-A	MA-314 BOARD, COMPLETE (E430: B)	
* 53	A-6791-515-A	MA-314 BOARD, COMPLETE (E430: VC)	
* 53	A-6791-516-A	MA-314 BOARD, COMPLETE (E530: VC)	
* 53	A-6791-517-A	MA-314 BOARD, COMPLETE (E480: EE)	
* 53	A-6791-518-A	MA-314 BOARD, COMPLETE (E177/E180: EG)	
* 53	A-6791-519-A	MA-314 BOARD, COMPLETE (E180: EE)	
* 53	A-6791-520-A	MA-314 BOARD, COMPLETE (E480: EG)	
* 53	A-6791-521-A	MA-314 BOARD, COMPLETE (E477)	
* 53	A-6791-522-A	MA-314 BOARD, COMPLETE (E380: EG)	
* 53	A-6791-523-A	MA-314 BOARD, COMPLETE (E380: EE)	
54	1-468-271-11	ETXNY 165E1D BLOCK	
⚠55	1-777-854-21	CORD, POWER	
* 56	3-979-382-01	PANEL, REAR (E) (E295: CP, VC1, VC2/E530: B, CP, VC)	
* 56	3-979-382-11	PANEL, REAR (E) (E295: UX/E530: UX)	
* 56	3-979-382-21	PANEL, REAR (E) (E285/E430: B, CP, VC)	
* 56	3-979-382-31	PANEL, REAR (E) (E430: AE, VP)	
* 56	3-979-382-41	PANEL, REAR (E) (E130/E230: AE, EY, UY, VP1, VP2)	
* 56	3-979-382-51	PANEL, REAR (E) (E230: CP)	
* 56	3-979-382-61	PANEL, REAR (E) (E177/E180: EG/E380:EG/E477/E480: EG)	
* 56	3-979-382-71	PANEL, REAR (E) (E180: EE/E380: EE/E480: EE)	
57	1-958-317-11	HARNESS (FE-113)	
58	1-958-316-11	HARNESS (AC-221)	
59	1-958-315-11	HARNESS (DM-129)	

8-1-3. MECHANISM CHASSIS ASSEMBLY (1)



Ref. No.	Part No.	Description	Remark
701	3-977-509-01	WASHER, THRUST	
702	3-977-507-01	TABLE, REEL (S)	
703	3-977-508-01	TABLE, REEL (T)	
704	1-500-144-11	HEAD, FE	
705	3-977-495-01	SHAFT TG2	
706	3-977-494-01	HOLDER, FEH	
707	A-6759-619-C	FL COMPLETE ASSY BOARD, COMPLETE	
708	3-977-535-01	PLATE, LUMINOUS (END SENSOR)	
709	3-977-536-01	PLATE, LUMINOUS (TOP SENSOR)	
710	3-970-471-01	SPRING (DECK OPEN), TORSION	
711	A-6759-615-A	PRESS BLOCK ASSY, PINCH	
712	3-958-455-01	SPRING (PINCH), TENSION	
713	3-977-447-01	GEAR, ELEVATOR	
714	3-977-514-01	OPENER, LID	
715	3-977-441-01	GEAR, PINCH PRESSING	
716	3-977-445-01	GEAR, TG8 ARM DRIVING	
717	3-977-465-01	SPRING, EXTENSION (RVS BRAKE)	
718	X-3947-582-1	ARM ASSY, RVS BRAKE	
719	3-977-446-01	GEAR, TG8 ARM	
720	X-3947-590-1	TG8 ASSY	
721	A-6759-620-A	HEAD BLOCK ASSY, ACE (ALPS) E URO	
722	3-974-556-01	+ HEXA TT 2.6X9 (TAPER)	
723	3-979-508-01	SCREW +HEXA TP SW 3X8	
724	3-978-485-01	PLATE, GUIDE CASSETTE	
725	3-977-443-01	WASHER, STOPPER	
726	3-989-036-01	STOPPER, LOCK LEVER (S)	

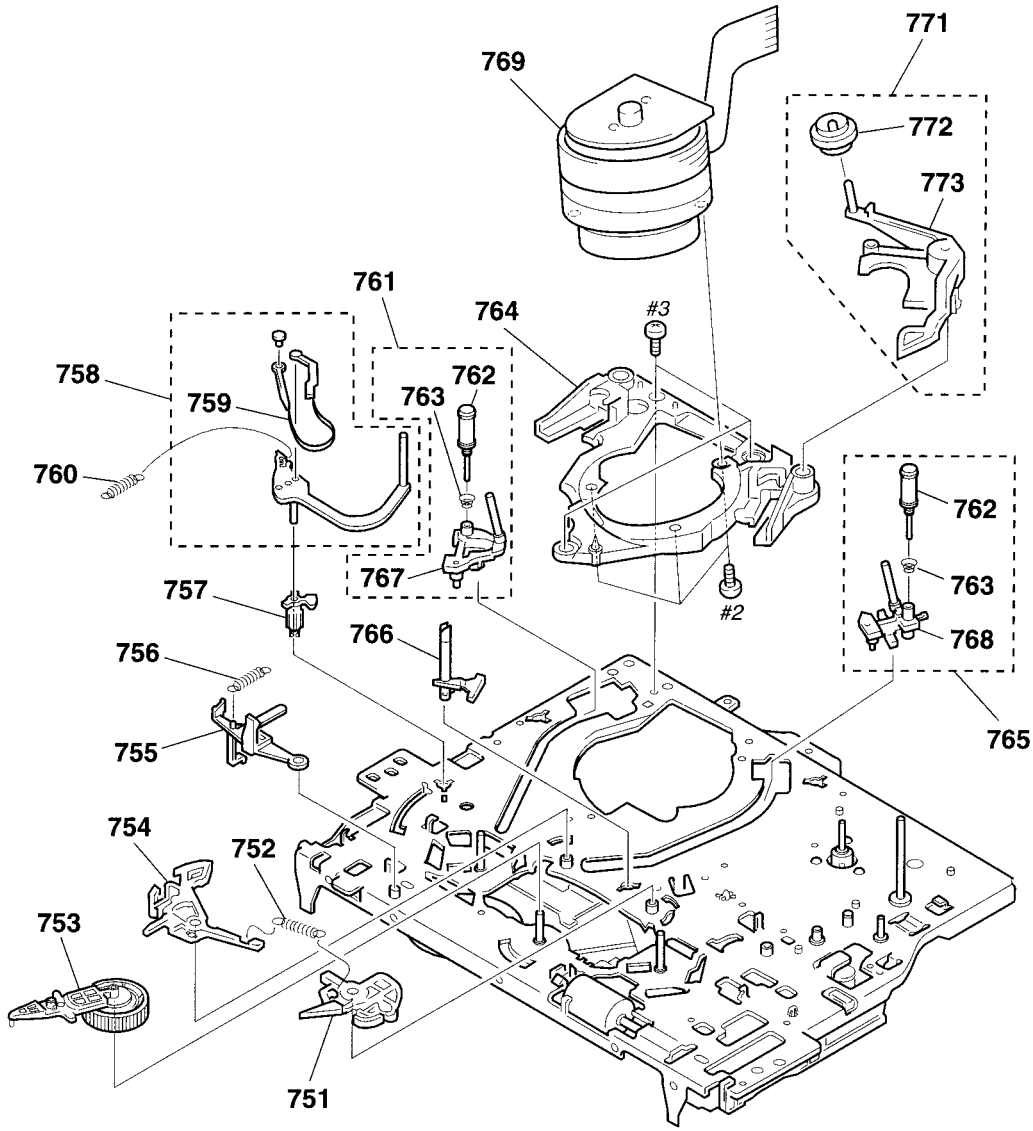
8-1-5. MECHANISM CHASSIS ASSEMBLY (3)



Ref. No.	Part No.	Description	Remark
801	3-977-437-01	RETAINER, CAM MOTOR	
802	X-3947-584-1	ASSY, REEL DIRECT	
803	3-977-443-01	WASHER, STOPPER	
804	3-977-438-01	WORM - WHEEL	
805	3-977-506-01	ARM, LIMITTER SELECTION	
806	3-977-444-01	GEAR, PINCH TRANSMISSION	
807	3-977-515-01	GUIDE, FL SLIDER	
808	3-977-517-01	PLATE, SLIDE, FL	
809	3-977-519-01	SPRING, TENS. (LIMIT, FL)	
810	3-977-518-02	PLATE, LIMITTER, FL	
811	3-977-516-01	HOLDER, FL SLIDER	
812	3-977-877-01	PLATE, RETAINER	
813	3-977-504-01	GEAR, CLUTCH	
814	X-3947-585-1	GEAR ASSY, PULLEY	
815	3-977-510-01	BELT, RUBBER	
816	3-977-440-01	WASHER, STOPPER	

Ref. No.	Part No.	Description	Remark
817	3-977-439-01	GEAR, CAM	
818	3-977-442-01	SLIDER	
819	3-977-455-01	GEAR, LOADING (T)	
820	3-977-456-03	SPRING, TORSION (LOAD T)	
821	X-3947-579-1	LEVER ASSY, LOADING (T)	
822	3-977-451-01	GEAR, LOADING (S)	
823	3-977-452-01	SPRING, TORSION (LOAD S)	
824	X-3947-578-1	LEVER ASSY, LOADING (S)	
825	X-3947-576-2	CHASSIS ASSY, MECHANICAL	
826	3-977-468-01	SHAFT, CAPSTAN BRAKE	
827	3-977-467-02	SPRING, CAP BRAKE	
828	X-3947-583-1	BRAKE ASSY, CAPSTAN	
829	3-977-489-01	ARM, TG1 DRIVING	
830	A-6759-616-A	GEAR BLOCK ASSY, LOADING (S)	
M902	1-698-971-11	MOTOR, DC (CAPSTAN)	
M903	X-3947-577-1	MOTOR ASSY, CAM	

8-1-4. MECHANISM CHASSIS ASSEMBLY (2)



Ref. No.	Part No.	Description	Remark
751	X-3947-581-1	BRAKE ASSY,MAIN (T)	
752	3-977-462-01	SPRING, EXTENTION. (MAIN BRAKE)	
753	X-3947-573-1	ARM ASSY, PENDULUM	
754	X-3947-580-2	BRAKE ASSY, MAIN (S)	
755	3-977-513-02	LEVER, REC. PROOF	
756	3-976-767-01	SPRING, TENS. (REC. PROOF)	
757	3-977-487-01	BOSS, TG1 FULCRUM	
758	X-3947-587-1	TG1 ASSY	
759	X-3947-589-1	BAND ASSY, TG1	
760	3-977-488-01	SPRING (POWER TENSION)	
761	A-6750-324-A	SHUTTLE (S) BLOCK ASSY	
762	X-3944-378-1	ROLLER ASSY, GUIDE	
763	3-965-178-01	SPRING	
764	3-969-632-04	BASE, DRUM	

Ref. No.	Part No.	Description	Remark
765	A-6750-325-A	SHUTTLE (T) BLOCK ASSY	
766	3-977-501-01	PLATE, LUMINOUS	
767	X-3946-855-1	SHUTTLE (S) ASSY	
768	X-3946-856-1	SHUTTLE (T) ASSY	
769	1-759-183-11	DRUM ASSY, DZH-78A-R (E130/E177/E180/E230: AE, CP, VP2/ E285: B/E380)	
769	1-759-522-11	DRUM ASSY, DZH-93A-R (E430/E477/E480/E530)	
769	1-759-523-11	DRUM ASSY, DZH-92A-R (E230: EY, UY, VP1/E285: VC/E295)	
771	A-6746-074-G	ROLLER BLOCK ASSY, HC	
772	X-3947-255-1	ROLLER ASSY, HC	
773	3-975-724-07	ARM, HC	

8-2. ELECTRICAL PARTS LIST

NOTE:
- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL: Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F: nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA. . : μA. . uPA. . : μPA. .
  uPB. . : μPB. . uPC. . : μPC. .
  uPD. . : μPD. .
- CAPACITORS
  uF: μF
- COILS
  uH: μH

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description			Remark
*	A-6794-518-A	DS-78 BOARD, COMPLETE (E380)			
*	A-6794-517-A	DS-78 BOARD, COMPLETE (E530)			
*	A-6794-505-A	DS-78 BOARD, COMPLETE (EXCEPT E380/E530)			
		********** (Ref.No. 1,000 Series)			
		< CONNECTOR >			
CN450	1-784-484-11	CONNECTOR, FFC/FPC 5P (E380/E530)			
		< DIODE >			
D450	8-719-946-30	LED SLR34DC3 (JOG) (E530)			
		< JUMPER RESISTOR >			
JR702	1-216-296-91	SHORT	0		
JR704	1-216-296-91	SHORT	0 (E530)		
JR706	1-216-296-91	SHORT	0 (E380/E530)		
JR707	1-216-295-91	SHORT	0		
JR708	1-216-296-91	SHORT	0 (E380/E530)		
JR709	1-216-296-91	SHORT	0 (E380/E530)		
		< RESISTOR >			
R450	1-216-041-00	METAL CHIP	470	5%	1/10W (E530)
R451	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R452	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
		< SWITCH >			
S450	1-571-977-11	SWITCH, TACTIL (FF) (E380/E530)			
S451	1-571-977-11	SWITCH, TACTIL (FF) (EXCEPT E380/E530)			
S452	1-571-977-11	SWITCH, TACTIL (PLAY) (EXCEPT E380/E530)			
S453	1-571-977-11	SWITCH, TACTIL (STOP) (EXCEPT E380/E530)			
S454	1-571-977-11	SWITCH, TACTIL (REW) (EXCEPT E380/E530)			
S455	1-571-977-11	SWITCH, TACTIL (REW) (E380/E530)			
S456	1-571-977-11	SWITCH, TACTIL (JOG) (E530)			
	1-468-271-11	ETXNY 165E1D BLOCK (Ref.No. 2,000 Series)			
		**********			
		< CAPACITOR >			
C003	9-980-236-01	ELECT	47uF		400V
C102	1-126-964-11	ELECT	10uF		50V
C107	1-126-965-11	ELECT	22uF		50V
C201	1-126-968-11	ELECT	100uF		50V
C302	1-126-968-11	ELECT	100uF		50V
C402	1-126-925-11	ELECT	470uF		10V
C501	1-126-960-11	ELECT	1uF		50V
		< DIODE >			
D001	8-719-066-97	DIODE 1N4007			
D002	8-719-066-97	DIODE 1N4007			
D003	8-719-066-97	DIODE 1N4007			
D004	8-719-066-97	DIODE 1N4007			
		< TRANSISTOR >			
Q102	8-729-423-29	TRANSISTOR 2SC3311A-QTA			
*	A-6794-507-A	FI-14 BOARD, COMPLETE (E295/E380EE/E530)			
		********** (Ref.No. 1,000 Series)			
		< CAPACITOR >			
C481	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C493	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
		< CONNECTOR >			
* CN480	1-568-942-11	PIN, CONNECTOR 4P			
		< DIODE >			
D480	8-719-109-97	DIODE RD6.8ES-B2			
D481	8-719-108-12	DIODE RD9.1E-W			
D491	8-719-108-12	DIODE RD9.1E-W			
		< JACK >			
J481	1-774-510-11	JACK, PIN 2P (LINE 2 IN)			
		< RESISTOR >			
R480	1-216-022-00	METAL CHIP	75	5%	1/10W
R491	1-216-041-00	METAL CHIP	470	5%	1/10W

MA-314

Ref. No.	Part No.	Description	Remark
*	A-6791-478-A	MA-314 BOARD, COMPLETE (E130)	
*	A-6791-518-A	MA-314 BOARD, COMPLETE (E177/E180EG)	
*	A-6791-519-A	MA-314 BOARD, COMPLETE (E180EE)	
*	A-6791-474-A	MA-314 BOARD, COMPLETE (E230AE)	
*	A-6791-475-A	MA-314 BOARD, COMPLETE (E230CP)	
*	A-6791-477-A	MA-314 BOARD, COMPLETE (E230EY)	
*	A-6791-440-A	MA-314 BOARD, COMPLETE (E230UY)	
*	A-6791-441-A	MA-314 BOARD, COMPLETE (E230: VP1,VP2)	
*	A-6791-476-A	MA-314 BOARD, COMPLETE (E285B)	
*	A-6791-442-A	MA-314 BOARD, COMPLETE (E285VC)	
*	A-6791-479-A	MA-314 BOARD, COMPLETE (E295CP)	
*	A-6791-443-A	MA-314 BOARD, COMPLETE (E295UX)	
*	A-6791-444-A	MA-314 BOARD, COMPLETE (E295: VC1,VC2)	
*	A-6791-523-A	MA-314 BOARD, COMPLETE (E380EE)	
*	A-6791-522-A	MA-314 BOARD, COMPLETE (E380EG)	
*	A-6791-510-A	MA-314 BOARD, COMPLETE (E430AE)	
*	A-6791-514-A	MA-314 BOARD, COMPLETE (E430B)	
*	A-6791-513-A	MA-314 BOARD, COMPLETE (E430CP)	
*	A-6791-511-A	MA-314 BOARD, COMPLETE (E430VP)	
*	A-6791-515-A	MA-314 BOARD, COMPLETE (E430VC)	
*	A-6791-521-A	MA-314 BOARD, COMPLETE (E477)	
*	A-6791-517-A	MA-314 BOARD, COMPLETE (E480EE)	
*	A-6791-520-A	MA-314 BOARD, COMPLETE (E480EG)	
*	A-6791-512-A	MA-314 BOARD, COMPLETE (E530B)	
*	A-6791-509-A	MA-314 BOARD, COMPLETE (E530CP)	
*	A-6791-508-A	MA-314 BOARD, COMPLETE (E530UX)	
*	A-6791-516-A	MA-314 BOARD, COMPLETE (E530VC)	
		**********	
			(Ref.No. 1,000 Series)
*	3-960-273-01	SPACER, TOP END	
*	3-960-274-01	SPACER, LED	

< CAPACITOR >

Ref. No.	Part No.	Description			Remark
C100	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C101	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C102	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C103	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C104	1-128-057-11	ELECT	330uF	20%	6.3V
C107	1-124-589-11	ELECT	47uF	20%	16V
C110	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C111	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C112	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C113	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C114	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C117	1-124-589-11	ELECT	47uF	20%	16V
C131	1-124-589-11	ELECT	47uF	20%	16V
C133	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C134	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C162	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C163	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C164	1-124-584-00	ELECT	100uF	20%	10V
C165	1-163-038-11	CERAMIC CHIP	0.1uF		25V
C166	1-163-038-11	CERAMIC CHIP	0.1uF		25V
C167	1-124-584-00	ELECT	100uF	20%	10V
C168	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C169	1-104-905-11	CAPACITOR	0.22F		5.5V
C170	1-128-131-11	ELECT	22uF	20%	50V
C171	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C172	1-128-131-11	ELECT	22uF	20%	50V
C173	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C174	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C175	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C176	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C177	1-128-131-11	ELECT	22uF	20%	50V
C178	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C179	1-124-584-00	ELECT	100uF	20%	10V
C180	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C181	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C182	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C184	1-163-007-11	CERAMIC CHIP	680PF	10%	50V
C185	1-163-038-11	CERAMIC CHIP	0.1uF		25V
C201	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C202	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C204	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C205	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C206	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C207	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C208	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C209	1-128-131-11	ELECT	22uF	20%	50V
C210	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C211	1-163-237-11	CERAMIC CHIP	27PF	5%	50V (E430/E477/E480/E530)
C211	1-163-239-11	CERAMIC CHIP	33PF	5%	50V (E130/E177/E180/E230/E285/E295/E380)
C213	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
C215	1-163-038-11	CERAMIC CHIP	0.1uF		25V
C217	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C218	1-163-243-11	CERAMIC CHIP	47PF	5%	50V (EXCEPT E180EE/E380EE/E480EE)
C219	1-163-038-11	CERAMIC CHIP	0.1uF		25V
C220	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C221	1-163-038-11	CERAMIC CHIP	0.1uF		25V (E295/E380EE/E430: AE,VP/E530)
C222	1-163-243-11	CERAMIC CHIP	47PF	5%	50V (E430: AE, VP)
C223	1-124-589-11	ELECT	47uF	20%	16V
C224	1-164-159-11	CERAMIC	0.1uF		50V
C226	1-163-038-11	CERAMIC CHIP	0.1uF		25V
C227	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
C228	1-126-157-11	ELECT	10uF	20%	16V
C229	1-164-159-11	CERAMIC	0.1uF		50V
C230	1-126-967-11	ELECT	47uF	20%	16V
C231	1-126-157-11	ELECT	10uF	20%	16V
C232	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C233	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C234	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C235	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C236	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C237	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C238	1-163-038-11	CERAMIC CHIP	0.1uF		25V
C239	1-126-967-11	ELECT	47uF	20%	16V
C240	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C241	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C242	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C243	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C244	1-163-038-11	CERAMIC CHIP	0.1uF		25V
C245	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C246	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C247	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V

Ref. No.	Part No.	Description			Remark
C248	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C249	1-126-967-11	ELECT	47uF	20%	16V
C250	1-163-038-11	CERAMIC CHIP	0.1uF		25V
C251	1-163-038-11	CERAMIC CHIP	0.1uF		25V
C252	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C253	1-163-038-11	CERAMIC CHIP	0.1uF		25V
C255	1-163-038-11	CERAMIC CHIP	0.1uF		25V
C256	1-163-038-11	CERAMIC CHIP	0.1uF		25V
C260	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C261	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
					(E430/E477/E480/E530)
C264	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C265	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
					(E430/E477/E480/E530)
C266	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C267	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C268	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C269	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C270	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C271	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C272	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
					(E430/E477/E480/E530)
C272	1-164-232-11	CERAMIC CHIP	0.01uF		50V
					(E130/E177/E180/E230/E285/E295/E380)
C273	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
					(E430/E477/E480/E530)
C273	1-216-025-91	RES, CHIP	100	5%	1/10W
					(E130/E177/E180/E230/E285/E295/E380)
C274	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
					(E430/E477/E480/E530)
C276	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C277	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C278	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
					(E430/E477/E480/E530)
C279	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
					(E430/E477/E480/E530)
C280	1-124-584-00	ELECT	100uF	20%	10V
C281	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C282	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C283	1-163-038-11	CERAMIC CHIP	0.1uF		25V
C284	1-163-038-11	CERAMIC CHIP	0.1uF		25V
C286	1-124-584-00	ELECT	100uF	20%	10V
C287	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C288	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C289	1-163-038-11	CERAMIC CHIP	0.1uF		25V
C301	1-164-159-11	CERAMIC	0.1uF		50V
C302	1-124-589-11	ELECT	47uF	20%	16V
C303	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C304	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
					(E295/E380EE/E430: AE,VP/E530)
C305	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C306	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C307	1-126-157-11	ELECT	10uF	20%	16V
C308	1-124-589-11	ELECT	47uF	20%	16V
C309	1-126-963-11	ELECT	4.7uF	20%	50V
C310	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V
C311	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V
C312	1-137-370-11	FILM	0.01uF	5%	50V
C313	1-126-157-11	ELECT	10uF	20%	16V
C314	1-164-232-11	CERAMIC CHIP	0.01uF		50V

Ref. No.	Part No.	Description			Remark
C315	1-126-160-11	ELECT	1uF	20%	50V
C317	1-126-163-11	ELECT	4.7uF	20%	50V
C318	1-124-589-11	ELECT	47uF	20%	16V
C321	1-124-589-11	ELECT	47uF	20%	16V
C322	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C323	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C324	1-137-397-11	FILM	0.047uF	5%	100V
C400	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C421	1-163-038-11	CERAMIC CHIP	0.1uF		25V
C422	1-124-589-11	ELECT	47uF	20%	16V
C423	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C424	1-124-589-11	ELECT	47uF	20%	16V
C500	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
					(EXCEPT E180EE/E380EE/E480EE)
C510	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C511	1-124-589-11	ELECT	47uF	20%	16V
C512	1-124-589-11	ELECT	47uF	20%	16V
C513	1-126-935-11	ELECT	470uF	20%	6.3V
C530	1-124-589-11	ELECT	47uF	20%	16V
					(E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)
C531	1-107-725-11	CERAMIC CHIP	0.1uF	10%	16V
					(E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)
C532	1-126-933-11	ELECT	100uF	20%	16V
					(E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)
C541	1-124-584-00	ELECT	100uF	20%	10V
					(E230CP/E285/E295/E430: B, CP, VC/E530)
C542	1-107-725-11	CERAMIC CHIP	0.1uF	10%	16V
					(E230CP/E285/E295/E430: B, CP, VC/E530)
C543	1-107-725-11	CERAMIC CHIP	0.1uF	10%	16V
					(E230CP/E285/E295/E430: B, CP, VC/E530)
C544	1-107-725-11	CERAMIC CHIP	0.1uF	10%	16V
					(E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)
C545	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
					(E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)
C546	1-107-725-11	CERAMIC CHIP	0.1uF	10%	16V
					(E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)
C547	1-107-725-11	CERAMIC CHIP	0.1uF	10%	16V
					(E230CP/E285/E295/E430: B, CP, VC/E530)
C548	1-162-215-21	CAP, CERAMIC	47PF	5%	50V
					(E230CP/E285/E295/E430: B, CP, VC/E530)
C571	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
					(E230CP/E285/E295/E430/E530)
C572	1-124-261-00	ELECT	10uF	20%	50V
					(E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)
C580	1-107-725-11	CERAMIC CHIP	0.1uF	10%	16V
					(E230CP/E285/E295/E430: B, CP, VC/E530)
C581	1-126-964-11	ELECT	10uF	20%	50V
					(E230CP/E285/E295/E430: B, CP, VC/E530)
C582	1-124-261-00	ELECT	10uF	20%	50V
					(E230CP/E285/E295/E430: B, CP, VC/E530)
C583	1-124-261-00	ELECT	10uF	20%	50V
					(E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)

Ref. No.	Part No.	Description				Remark
C584	1-126-964-11	ELECT	10uF	20%	50V	
		(E230CP/E285/E295/E430: B, CP, VC/E530)				
C585	1-124-261-00	ELECT	10uF	20%	50V	
		(E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)				
C586	1-124-261-00	ELECT	10uF	20%	50V	
		(E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)				
C587	1-126-960-11	ELECT	1uF	20%	50V	
		(E230CP/E285/E295/E430: B, CP, VC/E530)				
C600	1-128-131-11	ELECT	22uF	20%	50V	
C601	1-128-131-11	ELECT	22uF	20%	50V	
C602	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C603	1-124-589-11	ELECT	47uF	20%	16V	
C605	1-128-131-11	ELECT	22uF	20%	50V	
C606	1-124-589-11	ELECT	47uF	20%	16V	
C607	1-124-248-00	ELECT	22uF	20%	35V	
C608	1-124-248-00	ELECT	22uF	20%	35V	
C610	1-107-725-11	CERAMIC CHIP	0.1uF	10%	16V	
C660	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C661	1-124-589-11	ELECT	47uF	20%	16V	
C662	1-137-372-11	FILM	0.022uF	5%	50V	
C663	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C666	1-163-099-00	CERAMIC CHIP	18PF	5%	50V	
C667	1-163-235-11	CERAMIC CHIP	22PF	5%	50V	
C668	1-163-253-11	CERAMIC CHIP	120PF	5%	50V	
C669	1-130-481-00	MYLAR	0.0068uF	5%	50V	
C670	1-124-499-11	ELECT, NONPOLAR	1uF	20%	50V	
C672	1-126-160-11	ELECT	1uF	20%	50V	
C673	1-163-245-11	CERAMIC CHIP	56PF	5%	50V	
		(E177/E180/E285B/E380/E430B/E477/E480/E530B)				
C674	1-163-231-11	CERAMIC CHIP	15PF	5%	50V	
C675	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C676	1-124-589-11	ELECT	47uF	20%	16V	
C677	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V	
C701	1-126-964-11	ELECT	10uF	20%	50V	
C704	1-126-964-11	ELECT	10uF	20%	50V	
C705	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C708	1-126-967-11	ELECT	47uF	20%	16V	
C709	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C710	1-128-131-11	ELECT	22uF	20%	50V	
C750	1-126-933-11	ELECT	100uF	20%	16V	
C751	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C752	1-126-933-11	ELECT	100uF	20%	16V	
C753	1-107-725-11	CERAMIC CHIP	0.1uF	10%	16V	
C754	1-126-924-11	ELECT	330uF	20%	10V	
		(EXCEPT E180EE/E380EE/E480EE)				
C755	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
		(EXCEPT E180EE/E380EE/E480EE)				
C850	1-163-038-11	CERAMIC CHIP	0.1uF		25V	
		(E230: VP1, VP2/E285/E295: UX, VC1, VC2/ E430: B, VC, VP/E530: B, UX, VC)				
C851	1-126-157-11	ELECT	10uF	20%	16V	
		(E230: VP1, VP2/E285/E295: UX, VC1, VC2/ E430: B, VC, VP/E530: B, UX, VC)				
C852	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V	
		(E230: VP1, VP2/E285/E295: UX, VC1, VC2/ E430: B, VC, VP/E530: B, UX, VC)				
C853	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V	
		(E230: VP1, VP2/E285/E295: UX, VC1, VC2/ E430: B, VC, VP/E530: B, UX, VC)				
C855	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V	
		(E230: VP1, VP2/E285/E295: UX, VC1, VC2/ E430: B, VC, VP/E530: B, UX, VC)				
C856	1-163-038-11	CERAMIC CHIP	0.1uF		25V	
		(E230: VP1, VP2/E285/E295: UX, VC1, VC2/ E430: B, VC, VP/E530: B, UX, VC)				
C970	1-163-259-91	CERAMIC CHIP	220PF	5%	50V	
		(E285B/E430B/E530B)				
C971	1-124-257-00	ELECT	2.2uF	20%	50V	
		(E285B/E430B/E530B)				
C972	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V	
		(E285B/E430B/E530B)				
C973	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
		(E285B/E430B/E530B)				
C974	1-109-982-11	CERAMIC CHIP	1uF	10%	10V	
		(E285B/E430B/E530B)				
C975	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V	
		(E285B/E430B/E530B)				
C976	1-163-259-91	CERAMIC CHIP	220PF	5%	50V	
		(E285B/E430B/E530B)				
C977	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
		(E285B/E430B/E530B)				
C978	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V	
		(E285B/E430B/E530B)				
C979	1-163-121-00	CERAMIC CHIP	150PF	5%	50V	
		(E285B/E430B/E530B)				
C980	1-107-725-11	CERAMIC CHIP	0.1uF	10%	16V	
		(E285B/E430B/E530B)				
C981	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
		(E285B/E430B/E530B)				
C982	1-163-007-11	CERAMIC CHIP	680PF	10%	50V	
		(E285B/E430B/E530B)				
C983	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V	
		(E285B/E430B/E530B)				
C984	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
		(E285B/E430B/E530B)				
C985	1-163-251-11	CERAMIC CHIP	100PF	5%	50V	
		(E285B/E430B/E530B)				
C986	1-126-157-11	ELECT	10uF	20%	16V	
		(E285B/E430B/E530B)				
C987	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V	
		(E285B/E430B/E530B)				
C988	1-163-251-11	CERAMIC CHIP	100PF	5%	50V	
		(E285B/E430B/E530B)				
C991	1-107-725-11	CERAMIC CHIP	0.1uF	10%	16V	
		(E285B/E430B/E530B)				
C992	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
		(E285B/E430B/E530B)				
C993	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
		(E285B/E430B/E530B)				
C994	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
		(E285B/E430B/E530B)				
C995	1-126-157-11	ELECT	10uF	20%	16V	
		(E285B/E430B/E530B)				
C996	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V	
		(E285B/E430B/E530B)				

Ref. No.	Part No.	Description	Remark
		< CONNECTOR >	
* CN101	1-568-954-11	PIN, CONNECTOR 5P	
CN102	1-779-723-11	CONNECTOR, BOARD TO BOARD 9P	
CN104	1-766-716-11	CONNECTOR, BOARD TO BOARD 3P	
CN161	1-506-469-11	PIN, CONNECTOR 4P (E295/E380EE/E530)	
CN162	1-506-468-11	PIN, CONNECTOR 3P	
CN163	1-506-469-11	PIN, CONNECTOR 4P (EXCEPT E380/E530)	
* CN163	1-568-936-11	PIN, CONNECTOR 9P (E380/E530)	
CN260	1-784-487-11	CONNECTOR, FFC/FPC 8P	
* CN262	1-560-893-00	PIN, CONNECTOR 5P	
CN301	1-506-469-11	PIN, CONNECTOR 4P	
CN302	1-506-468-11	PIN, CONNECTOR 3P	
* CN500	1-695-935-11	CONNECTOR (SQUARE TYPE) 21P (LINE 1 (TV)) (EXCEPT E180EE/E380EE/E480EE)	
* CN570	1-695-935-11	CONNECTOR (SQUARE TYPE) 21P (LINE 3) (E230CP/E285/E295/E430/E530)	
CN600	1-569-667-11	CONNECTOR, BOARD TO BOARD 8P	
		< JACK >	
CNJ500	1-779-010-11	JACK, PIN 4P (LINE 1 IN/LINE OUT) (E180EE/E380EE/E480EE)	
		< DIODE >	
D101	8-719-200-82	DIODE 11ES2	
D102	8-719-048-26	DIODE GL528V1	
D104	8-719-200-82	DIODE 11ES2	
D161	8-719-200-82	DIODE 11ES2 (E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)	
D162	8-719-056-07	DIODE SLR-342MCT31 (ON/STANDBY)	
D163	8-719-200-82	DIODE 11ES2	
D164	8-719-200-82	DIODE 11ES2	
D165	8-719-109-97	DIODE RD6.8ES-B2	
D166	8-719-109-97	DIODE RD6.8ES-B2	
D401	8-719-109-97	DIODE RD6.8ES-B2	
D500	8-719-109-97	DIODE RD6.8ES-B2	
D501	8-719-109-97	DIODE RD6.8ES-B2	
D504	8-719-109-97	DIODE RD6.8ES-B2	
D505	8-719-109-97	DIODE RD6.8ES-B2	
D511	8-719-109-97	DIODE RD6.8ES-B2 (EXCEPT E180EE/E380EE/E480EE)	
D512	8-719-921-86	DIODE MTZJ-13 (EXCEPT E180EE/E380EE/E480EE)	
D513	8-719-109-97	DIODE RD6.8ES-B2 (EXCEPT E180EE/E380EE/E480EE)	
D514	8-719-109-97	DIODE RD6.8ES-B2 (EXCEPT E180EE/E380EE/E480EE)	
D515	8-719-109-97	DIODE RD6.8ES-B2 (EXCEPT E180EE/E380EE/E480EE)	
D516	8-719-109-97	DIODE RD6.8ES-B2 (EXCEPT E180EE/E380EE/E480EE)	
D517	8-719-109-97	DIODE RD6.8ES-B2	
D540	8-719-109-97	DIODE RD6.8ES-B2 (E230CP/E285/E295/E430/E530)	
D541	8-719-109-97	DIODE RD6.8ES-B2 (E230CP/E285/E295/E430/E530)	
D542	8-719-109-97	DIODE RD6.8ES-B2 (E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)	
D543	8-719-109-97	DIODE RD6.8ES-B2 (E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)	
D544	8-719-109-97	DIODE RD6.8ES-B2 (E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)	
D545	8-719-109-97	DIODE RD6.8ES-B2	
D571	8-719-109-97	DIODE RD6.8ES-B2 (E230CP/E285/E295/E430/E530)	
D572	8-719-109-97	DIODE RD6.8ES-B2 (E230CP/E285/E295/E430/E530)	
D575	8-719-109-97	DIODE RD6.8ES-B2 (E230CP/E285/E295/E430: B, CP, VC/E530)	
D576	8-719-109-97	DIODE RD6.8ES-B2 (E230CP/E285/E295/E430: B, CP, VC/E530)	
D579	8-719-109-97	DIODE RD6.8ES-B2 (E230CP/E285/E295/E430/E530)	
D580	8-719-911-19	DIODE 1SS119	
D581	8-719-911-19	DIODE 1SS119	
D582	8-719-109-97	DIODE RD6.8ES-B2	
D583	8-719-109-97	DIODE RD6.8ES-B2	
D600	8-719-911-19	DIODE 1SS119	
D601	8-719-911-19	DIODE 1SS119	
D602	8-719-109-85	DIODE RD5.1ES-B2	
D661	8-719-911-19	DIODE 1SS119	
D662	8-719-911-19	DIODE 1SS119	
D702	8-719-982-26	DIODE MTZJ-33B	
D703	8-719-109-97	DIODE RD6.8ES-B2	
D751	8-719-109-85	DIODE RD5.1ES-B2	
D752	8-719-911-19	DIODE 1SS119	
		< FILTER >	
FL500	1-236-163-11	ENCAPSULATED COMPONENT	
FL502	1-236-163-11	ENCAPSULATED COMPONENT	
FL570	1-236-163-11	ENCAPSULATED COMPONENT (E230CP/E285/E295/E430/E530)	
FL572	1-236-163-11	ENCAPSULATED COMPONENT (E230CP/E285/E295/E430: B, CP, VC/E530)	
FL660	1-233-527-11	FILTER, TRAP	
		< IC >	
IC130	8-759-481-46	IC LB1943	
IC161	8-759-482-27	IC M37777MAA104GP (E230/E285B/E295/E380EG/E430/ E480EG/E530: CP, UX, VC)	
IC161	8-759-495-33	IC M37777MAA105GP (E130/E177/E180EG/E477)	
IC161	8-759-482-29	IC M37777M7A238GP-C (E180EE/E380EE/E480EE)	
IC161	8-759-534-75	IC M37777MAA106GP (E285C/E530B)	
IC162	8-759-248-87	IC MM1256XF-BE	
IC163	8-759-432-32	IC ST24W04FM6TR	
IC163	8-759-432-33	IC ST24W08FM6TR	
IC163	8-759-518-23	IC X24C04S8	
IC163	8-759-454-78	IC 24LC08BT/SN	
IC201	8-759-479-25	IC LA71514M-MPB	
IC202	8-759-439-50	IC LC89977M-TE-L	
IC260	8-759-352-17	IC HA118195NT (E430/E477/E480/E530)	
IC260	8-759-357-84	IC HA118295NT (E130/E177/E180/E230/E285/E295/E380)	

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Ref. No.	Part No.	Description	Remark
IC301	8-759-499-30	IC BA7755AF-E2	
IC400	8-742-042-00	HY B IC SBX1986-51	
IC420	8-759-366-44	IC uPD16312GB-3B4	
⚠IC530	8-759-438-18	IC PQ12RD08 (E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)	
IC540	8-759-438-16	IC STV6400D (E230CP/E285/E295/E430: B, CP, VC/E530)	
IC580	8-759-300-71	IC HD14053BFP (E230CP/E285/E295/E430: B, CP, VC/E530)	
⚠IC600	8-759-438-18	IC PQ12RD08	
IC660	8-759-480-27	IC LC74790M-9693-TLM (E130/E230/E285/E295/E430/E530)	
IC660	8-759-480-26	IC LC74790M-9702-TLM (E177/E180/E380/E477/E480)	
IC850	8-759-484-61	IC SDA5650X-GEG (E230: VP1, VP2/E285/E295: UX, VC1, VC2/ E430: B, VC, VP/E530: B, UX, VC)	
IC970	8-759-438-17	IC LA7337 (E285B/E430B/E530B)	
		< JUMPER RESISTOR >	
JR001	1-216-296-91	SHORT 0	
JR002	1-216-295-91	SHORT 0	
JR003	1-216-295-91	SHORT 0 (E530)	
JR004	1-216-296-91	SHORT 0	
JR005	1-216-296-91	SHORT 0 (E530)	
JR006	1-216-296-91	SHORT 0	
JR007	1-216-296-91	SHORT 0	
JR008	1-216-296-91	SHORT 0	
JR009	1-216-296-91	SHORT 0	
JR010	1-216-296-91	SHORT 0	
JR011	1-216-296-91	SHORT 0 (E295/E380EE/E530)	
JR012	1-216-296-91	SHORT 0	
JR013	1-216-295-91	SHORT 0	
JR014	1-216-296-91	SHORT 0	
JR015	1-216-296-91	SHORT 0	
JR016	1-216-296-91	SHORT 0	
JR017	1-216-296-91	SHORT 0	
JR018	1-216-296-91	SHORT 0	
JR019	1-216-296-91	SHORT 0	
JR020	1-216-296-91	SHORT 0 (E295/E380EE/E530)	
JR021	1-216-296-91	SHORT 0 (E230CP/E285/E295/E430/E530)	
JR022	1-216-296-91	SHORT 0 (E230CP/E285/E295/E430/E530)	
JR023	1-216-296-91	SHORT 0	
JR024	1-216-295-91	SHORT 0	
JR025	1-216-296-91	SHORT 0 (E230CP/E285/E295/E430: B, CP, VC/E530)	
JR026	1-216-296-91	SHORT 0	
JR027	1-216-295-91	SHORT 0	
JR028	1-216-295-91	SHORT 0 (E285B/E430B/E530B)	
JR029	1-216-296-91	SHORT 0	
JR030	1-216-296-91	SHORT 0	
JR031	1-216-296-91	SHORT 0	
JR032	1-216-296-91	SHORT 0	
JR033	1-216-295-91	SHORT 0	
JR034	1-216-296-91	SHORT 0	
JR036	1-216-296-91	SHORT 0	
JR037	1-216-295-91	SHORT 0	
JR038	1-216-296-91	SHORT 0	
JR039	1-216-296-91	SHORT 0	
JR040	1-216-296-91	SHORT 0	
JR041	1-216-296-91	SHORT 0	
JR042	1-216-296-91	SHORT 0 (E285B/E430B/E530B)	
JR043	1-216-295-91	SHORT 0 (E285B/E430B/E530B)	
JR044	1-216-296-91	SHORT 0 (E285B/E430B/E530B)	
JR045	1-216-296-91	SHORT 0	
JR046	1-216-296-91	SHORT 0	
JR047	1-216-295-91	SHORT 0	
JR048	1-216-295-91	SHORT 0	
JR049	1-216-296-91	SHORT 0	
JR050	1-216-296-91	SHORT 0	
JR051	1-216-296-91	SHORT 0	
JR052	1-216-296-91	SHORT 0	
JR053	1-216-296-91	SHORT 0	
JR054	1-216-296-91	SHORT 0	
JR055	1-216-296-91	SHORT 0	
JR056	1-216-296-91	SHORT 0	
JR057	1-216-296-91	SHORT 0 (E285B/E430B/E530B)	
JR058	1-216-295-91	SHORT 0	
JR059	1-216-296-91	SHORT 0	
JR060	1-216-295-91	SHORT 0	
JR061	1-216-296-91	SHORT 0 (E285B/E430B/E530B)	
JR062	1-216-296-91	SHORT 0	
JR063	1-216-296-91	SHORT 0 (E285B/E430B/E530B)	
JR064	1-216-296-91	SHORT 0	
JS541	1-216-296-91	SHORT 0 (E130/E177/E180/E230: AE, EY, UY, VP1, VP2/ E380/E430: AE, VP/E477/E480)	
JS572	1-216-296-91	SHORT 0 (E130/E177/E180/E230: AE, EY, UY, VP1, VP2/ E295UX/E380/E430: AE, VP/E477/E480/E530UX)	
JS573	1-216-296-91	SHORT 0 (E130/E177/E180/E230: AE, EY, UY, VP1, VP2/ E380/E430: AE, VP/E477/E480)	
JS750	1-216-295-91	SHORT 0 (EXCEPT E180EE/E380EE/E480EE)	
JS751	1-216-295-91	SHORT 0 (E180EE/E380EE/E480EE)	
		< COIL >	
L161	1-414-936-21	INDUCTOR 22uH	
L162	1-414-936-21	INDUCTOR 22uH	
L163	1-414-936-21	INDUCTOR 22uH	
L164	1-414-936-21	INDUCTOR 22uH	
L201	1-414-946-21	INDUCTOR 39uH	
L202	1-414-940-21	INDUCTOR 100uH	
L204	1-414-934-21	INDUCTOR 10uH	
L205	1-414-940-21	INDUCTOR 100uH	
L206	1-414-934-21	INDUCTOR 10uH	
L207	1-414-934-21	INDUCTOR 10uH	
L208	1-469-014-21	INDUCTOR 120uH	

The components identified by mark ⚠or dotted line with mark ⚠are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
L262	1-414-940-21	INDUCTOR 100uH	
L263	1-414-940-21	INDUCTOR 100uH	
L301	1-414-940-21	INDUCTOR 100uH	
L321	1-414-940-21	INDUCTOR 100uH	
L510	1-414-940-21	INDUCTOR 100uH	
L530	1-414-940-21	INDUCTOR 100uH (E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)	
L540	1-414-934-21	INDUCTOR 10uH (E230CP/E285/E295/E430: B, CP, VC/E530)	
L580	1-414-940-21	INDUCTOR 100uH (E230CP/E285/E295/E430: B, CP, VC/E530)	
L600	1-414-939-21	INDUCTOR 68uH	
L601	1-414-934-21	INDUCTOR 10uH	
L661	1-414-940-21	INDUCTOR 100uH	
L662	1-414-936-21	INDUCTOR 22uH (E177/E180/E285B/E380/E430B/E477/E480/E530B)	
L663	1-414-940-21	INDUCTOR 100uH	
L701	1-414-930-21	INDUCTOR 2.2uH	
L750	1-414-930-21	INDUCTOR 2.2uH	
L751	1-414-930-21	INDUCTOR 2.2uH (EXCEPT E180EE/E380EE/E480EE)	
L970	1-414-933-11	INDUCTOR 6.8uH(E285B/E430B/E530B)	
L971	1-414-945-11	INDUCTOR 27uH (E285B/E430B/E530B)	
L972	1-414-938-21	INDUCTOR 47uH (E285B/E430B/E530B)	
L973	1-414-938-21	INDUCTOR 47uH (E285B/E430B/E530B)	
L975	1-414-934-21	INDUCTOR 10uH (E285B/E430B/E530B)	
		< FLUORECENT INDICATOR >	
ND420	1-517-724-11	TUBE, FLUORESCENT INDICATOR	
		< PHOTO INTERRUPTER >	
PH100	8-749-013-23	PHOTO INTERRUPTER GP3S120	
PH101	8-749-013-23	PHOTO INTERRUPTER GP3S120	
		< IC LINK >	
⚠PS100	1-533-586-31	LINK, IC 491.315 (315mA)	
⚠PS131	1-533-586-31	LINK, IC 491.315 (315mA) (E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CO, VC)	
⚠PS600	1-533-593-11	LINK, IC 491002 (2A)	
⚠PS601	1-533-589-21	LINK, IC 491.750 (750mA)	
		< TRANSISTOR >	
Q100	8-729-043-84	TRANSISTOR PT380F3	
Q101	8-729-043-84	TRANSISTOR PT380F3	
Q102	8-729-281-53	TRANSISTOR 2SC1815-GR	
Q161	8-729-804-41	TRANSISTOR 2SB1122-S (E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)	
Q162	8-729-421-19	TRANSISTOR UN2213 (E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)	
Q163	8-729-421-19	TRANSISTOR UN2213	
Q201	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q202	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q208	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q209	8-729-216-22	TRANSISTOR 2SA1162	
Q210	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q211	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q260	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q301	8-729-281-53	TRANSISTOR 2SC1815-GR	
Q321	8-729-802-91	TRANSISTOR 2SD879	
Q501	8-729-424-08	TRANSISTOR UN2111 (EXCEPT E180EE/E380EE/E480EE)	
Q502	8-729-421-19	TRANSISTOR UN2213 (EXCEPT E180EE/E380EE/E480EE)	
Q503	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q510	8-729-216-22	TRANSISTOR 2SA1162	
Q540	8-729-216-22	TRANSISTOR 2SA1162 (E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)	
Q580	8-729-422-27	TRANSISTOR 2SD601A-Q (E230CP/E285/E295/E430: B, CP, VC/E530)	
Q581	8-729-421-19	TRANSISTOR UN2213 (E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)	
Q582	8-729-421-19	TRANSISTOR UN2213 (E230CP/E285/E295/E430: B, CP, VC/E530)	
Q583	8-729-421-19	TRANSISTOR UN2213 (E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)	
⚠Q600	8-729-140-93	TRANSISTOR 2SB733-34	
Q601	8-729-422-27	TRANSISTOR 2SD601A-Q	
Q602	8-729-018-99	TRANSISTOR 2SD2394-F	
Q603	8-729-140-96	TRANSISTOR KSC1008 (EXCEPT E180EE/E380EE/E480EE)	
Q604	8-729-424-08	TRANSISTOR UN2111 (EXCEPT E180EE/E380EE/E480EE)	
Q605	8-729-421-19	TRANSISTOR UN2213 (EXCEPT E180EE/E380EE/E480EE)	
Q606	8-729-119-79	TRANSISTOR 2SC2785-FEK	
Q660	8-729-216-22	TRANSISTOR 2SA1162	
Q661	8-729-216-22	TRANSISTOR 2SA1162	
Q662	8-729-216-22	TRANSISTOR 2SA1162	
Q750	8-729-012-31	TRANSISTOR 2SC4040-TL2-Q	
Q751	8-729-421-19	TRANSISTOR UN2213 (EXCEPT E180EE/E380EE/E480EE)	
Q752	8-729-216-22	TRANSISTOR 2SA1162 (EXCEPT E180EE/E380EE/E480EE)	
Q850	8-729-216-22	TRANSISTOR 2SA1162 (E230: VP1, VP2/E285/E295: UX, VC1, VC2/ E430: B, VC, VP/E530: B, UX, VC)	
Q970	8-729-216-22	TRANSISTOR 2SA1162 (E285B/E430B/E530B)	
Q972	8-729-424-08	TRANSISTOR UN2111 (E285B/E430B/E530B)	
Q973	8-729-422-27	TRANSISTOR 2SD601A-Q (E285B/E430B/E530B)	
Q974	8-729-422-27	TRANSISTOR 2SD601A-Q (E285B/E430B/E530B)	
Q975	8-729-424-08	TRANSISTOR UN2111 (E285B/E430B/E530B)	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remark
Q976	8-729-421-19	TRANSISTOR UN2213			(E285B/E430B/E530B)
		< RESISTOR >			
R100	1-216-089-91	RES, CHIP	47K	5%	1/10W
R101	1-249-413-11	CARBON	470	5%	1/4W F
R103	1-249-437-11	CARBON	47K	5%	1/4W
R104	1-216-081-00	METAL CHIP	22K	5%	1/10W
R105	1-216-081-00	METAL CHIP	22K	5%	1/10W
R106	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R107	1-216-049-91	RES, CHIP	1K	5%	1/10W
R108	1-249-400-11	CARBON	39	5%	1/4W F
R109	1-249-400-11	CARBON	39	5%	1/4W F
R111	1-216-065-91	RES, CHIP	4.7K	5%	1/10W
R112	1-216-089-91	RES, CHIP	47K	5%	1/10W
R113	1-216-089-91	RES, CHIP	47K	5%	1/10W
R114	1-216-089-91	RES, CHIP	47K	5%	1/10W
R115	1-216-089-91	RES, CHIP	47K	5%	1/10W
R119	1-249-413-11	CARBON	470	5%	1/4W F
R120	1-216-097-91	RES, CHIP	100K	5%	1/10W
R122	1-249-413-11	CARBON	470	5%	1/4W F
R123	1-247-815-91	CARBON	220	5%	1/4W
R130	1-216-085-00	METAL CHIP	33K	5%	1/10W
R131	1-216-085-00	METAL CHIP	33K	5%	1/10W
R134	1-216-089-91	RES, CHIP	47K	5%	1/10W
R135	1-216-073-00	METAL CHIP	10K	5%	1/10W
R136	1-216-077-00	METAL CHIP	15K	5%	1/10W
R160	1-216-073-00	METAL CHIP	10K	5%	1/10W
R161	1-216-049-91	RES, CHIP	1K	5%	1/10W (E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)
R162	1-216-049-91	RES, CHIP	1K	5%	1/10W (E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)
R163	1-249-407-11	CARBON	150	5%	1/4W F
R164	1-249-413-11	CARBON	470	5%	1/4W F
R167	1-216-049-91	RES, CHIP	1K	5%	1/10W (E130/E180EE/E230/E285VC/E295/ E380EE/E480EE/E530UX)
R168	1-216-049-91	RES, CHIP	1K	5%	1/10W (E130/E180EE/E230/E285/E295/ E380EE/E430/E530)
R169	1-216-049-91	RES, CHIP	1K	5%	1/10W (E130/E177/E180/E230: AE, CP, VP1, VP2/ E285VC/E295: CP, VC1, VC2/E380EG/ E430: AE, CP, VC, VP/E477/E480/E530: CP, VC)
R170	1-216-121-91	RES, CHIP	1M	5%	1/10W
R171	1-216-065-91	RES, CHIP	4.7K	5%	1/10W
R172	1-249-429-11	CARBON	10K	5%	1/4W
R173	1-216-039-00	METAL CHIP	390	5%	1/10W
R174	1-218-179-11	RES, CHIP	10M	5%	1/10W
R175	1-216-113-00	METAL CHIP	470K	5%	1/10W
R176	1-216-041-00	METAL CHIP	470	5%	1/10W
R177	1-216-105-91	RES, CHIP	220K	5%	1/10W
R178	1-216-041-00	METAL CHIP	470	5%	1/10W
R179	1-216-041-00	METAL CHIP	470	5%	1/10W
R181	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R182	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R184	1-216-073-00	METAL CHIP	10K	5%	1/10W

Ref. No.	Part No.	Description			Remark
R185	1-216-295-91	SHORT	0		(E130/E177/E180EG/E230UY/E285B/E430AE)
R185	1-216-053-00	METAL CHIP	1.5K	5%	1/10W (E230:AE,EY/380EG/E430CP)
R185	1-216-061-00	METAL CHIP	3.3K	5%	1/10W (E230CP/E295UX/E430: B, VP/E480EG)
R185	1-216-067-00	METAL CHIP	5.6K	5%	1/10W (E230: VP1, VP2/E430VC/E477/E530B)
R185	1-216-071-00	METAL CHIP	8.2K	5%	1/10W (E285VC/E530: CP, UX)
R185	1-216-075-00	METAL CHIP	12K	5%	1/10W (E295CP/E530VC)
R185	1-216-085-00	METAL CHIP	33K	5%	1/10W (E295: VC1, VC2)
R186	1-216-049-91	RES, CHIP	1K	5%	1/10W
R187	1-216-295-91	SHORT	0		
R188	1-216-295-91	SHORT	0		
R189	1-249-417-11	CARBON	1K	5%	1/4W F
R190	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R191	1-216-089-91	RES, CHIP	47K	5%	1/10W
R192	1-216-089-91	RES, CHIP	47K	5%	1/10W
R194	1-216-295-91	SHORT	0		
R196	1-216-089-91	RES, CHIP	47K	5%	1/10W
R198	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R199	1-249-437-11	CARBON	47K	5%	1/4W
R201	1-216-041-00	METAL CHIP	470	5%	1/10W
R202	1-216-067-00	METAL CHIP	5.6K	5%	1/10W (E430/E477/E480/E530)
R202	1-216-065-91	RES, CHIP	4.7K	5%	1/10W (E130/E177/E180/E230/E285/E295/E380)
R203	1-249-413-11	CARBON	470	5%	1/4W F
R204	1-216-047-91	RES, CHIP	820	5%	1/10W
R205	1-216-037-00	METAL CHIP	330	5%	1/10W
R206	1-216-037-00	METAL CHIP	330	5%	1/10W
R207	1-216-073-00	METAL CHIP	10K	5%	1/10W
R208	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R209	1-216-041-00	METAL CHIP	470	5%	1/10W
R210	1-216-025-91	RES, CHIP	100	5%	1/10W
R218	1-216-065-91	RES, CHIP	4.7K	5%	1/10W
R219	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R221	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R222	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R223	1-216-017-91	RES, CHIP	47	5%	1/10W
R224	1-216-017-91	RES, CHIP	47	5%	1/10W (E295/E380EE/E430: AE, VP/E530)
R225	1-216-295-91	SHORT	0		
R226	1-216-025-91	RES, CHIP	100	5%	1/10W
R227	1-216-025-91	RES, CHIP	100	5%	1/10W
R228	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R229	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R230	1-216-045-00	METAL CHIP	680	5%	1/10W
R231	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R232	1-216-049-91	RES, CHIP	1K	5%	1/10W
R233	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R234	1-216-089-91	RES, CHIP	47K	5%	1/10W
R235	1-216-049-91	RES, CHIP	1K	5%	1/10W
R236	1-216-049-91	RES, CHIP	1K	5%	1/10W
R237	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R238	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R239	1-216-057-00	METAL CHIP	2.2K	5%	1/10W

Ref. No.	Part No.	Description			Remark
R240	1-216-049-91	RES, CHIP	1K	5%	1/10W
R243	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R260	1-216-045-00	METAL CHIP	680	5%	1/10W
R261	1-216-045-00	METAL CHIP	680	5%	1/10W (E430/E477/E480/E530)
R262	1-216-295-91	SHORT	0		
R263	1-216-295-91	SHORT	0		
R264	1-216-295-91	SHORT	0		
R265	1-216-295-91	SHORT	0 (E430/E477/E480/E530)		
R266	1-216-055-00	METAL CHIP	1.8K	5%	1/10W (E430/E477/E480/E530)
R266	1-216-053-00	METAL CHIP	1.5K	5%	1/10W (E230: EY, UY/E295)
R266	1-216-051-00	METAL CHIP	1.2K	5%	1/10W (E130/E177/E180/E230: AE, CP, VP1, VP2/ E285/E380)
R267	1-216-073-00	METAL CHIP	10K	5%	1/10W
R268	1-216-081-00	METAL CHIP	22K	5%	1/10W
R269	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R270	1-216-081-00	METAL CHIP	22K	5%	1/10W
R271	1-216-049-91	RES, CHIP	1K	5%	1/10W
R272	1-216-081-00	METAL CHIP	22K	5%	1/10W
R273	1-216-081-00	METAL CHIP	22K	5%	1/10W
R274	1-216-073-00	METAL CHIP	10K	5%	1/10W
R275	1-216-073-00	METAL CHIP	10K	5%	1/10W
R276	1-216-049-91	RES, CHIP	1K	5%	1/10W
R278	1-216-025-91	RES, CHIP	100	5%	1/10W (E130/E177/E180/E230/E285/E295/E380)
R301	1-216-093-00	METAL CHIP	68K	5%	1/10W
R302	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R303	1-216-093-00	METAL CHIP	68K	5%	1/10W
R304	1-216-093-00	METAL CHIP	68K	5%	1/10W (E295/E380EE/E430: AE, VP/E530)
R305	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R306	1-216-073-00	METAL CHIP	10K	5%	1/10W
R307	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R308	1-216-067-00	METAL CHIP	5.6K	5%	1/10W (E295/E380EE/E430: AE, VP/E530)
R309	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R310	1-216-129-00	METAL CHIP	2.2M	5%	1/10W
R311	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R312	1-216-079-00	METAL CHIP	18K	5%	1/10W
R313	1-216-109-00	METAL CHIP	330K	5%	1/10W
R314	1-216-035-00	METAL CHIP	270	5%	1/10W
R315	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R316	1-216-073-00	METAL CHIP	10K	5%	1/10W
R317	1-216-079-00	METAL CHIP	18K	5%	1/10W
R318	1-216-075-00	METAL CHIP	12K	5%	1/10W
R320	1-216-047-91	RES, CHIP	820	5%	1/10W
R321	1-249-401-11	CARBON	47	5%	1/4W F
R322	1-216-063-91	RES, CHIP	3.9K	5%	1/10W
R323	1-249-381-11	CARBON	1	5%	1/4W F
R324	1-216-031-00	METAL CHIP	180	5%	1/10W
R401	1-216-073-00	METAL CHIP	10K	5%	1/10W
R402	1-216-013-00	METAL CHIP	33	5%	1/10W
R403	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R404	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R405	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R406	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R407	1-216-065-91	RES, CHIP	4.7K	5%	1/10W
R408	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R412	1-216-073-00	METAL CHIP	10K	5%	1/10W
R413	1-216-013-00	METAL CHIP	33	5%	1/10W
R414	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R415	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R416	1-216-065-91	RES, CHIP	4.7K	5%	1/10W (EXCEPT E130/E230)
R417	1-216-081-00	METAL CHIP	22K	5%	1/10W (EXCEPT E130/E230)
R418	1-216-689-11	METAL CHIP	39K	0.5%	1/10W (EXCEPT E130/E230)
R422	1-249-417-11	CARBON	1K	5%	1/4W F
R423	1-249-417-11	CARBON	1K	5%	1/4W F
R424	1-249-417-11	CARBON	1K	5%	1/4W F
R425	1-216-085-00	METAL CHIP	33K	5%	1/10W
R426	1-216-065-91	RES, CHIP	4.7K	5%	1/10W
R500	1-216-041-00	METAL CHIP	470	5%	1/10W
R501	1-216-041-00	METAL CHIP	470	5%	1/10W
R502	1-216-041-00	METAL CHIP	470	5%	1/10W
R504	1-216-033-00	METAL CHIP	220	5%	1/10W
R505	1-216-049-91	RES, CHIP	1K	5%	1/10W
R510	1-249-408-11	CARBON	180	5%	1/4W F
R511	1-249-407-11	CARBON	150	5%	1/4W F
R512	1-216-021-00	METAL CHIP	68	5%	1/10W
R514	1-216-037-00	METAL CHIP	330	5%	1/10W
R515	1-216-049-91	RES, CHIP	1K	5%	1/10W (EXCEPT E180EE/E380EE/E480EE)
R516	1-216-065-91	RES, CHIP	4.7K	5%	1/10W (EXCEPT E180EE/E380EE/E480EE)
R517	1-216-022-00	METAL CHIP	75	5%	1/10W
R530	1-216-049-91	RES, CHIP	1K	5%	1/10W (E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)
R531	1-216-055-00	METAL CHIP	1.8K	5%	1/10W (E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)
R540	1-216-025-91	RES, CHIP	100	5%	1/10W (E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)
R541	1-216-053-00	METAL CHIP	1.5K	5%	1/10W (E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)
R542	1-216-053-00	METAL CHIP	1.5K	5%	1/10W (E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)
R545	1-216-085-00	METAL CHIP	33K	5%	1/10W
R546	1-216-089-91	RES, CHIP	47K	5%	1/10W (E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)
R547	1-216-049-91	RES, CHIP	1K	5%	1/10W (E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)
R548	1-216-022-00	METAL CHIP	75	5%	1/10W (E230CP/E285/E295/E430/E530)
R549	1-216-022-00	METAL CHIP	75	5%	1/10W (E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)
R570	1-216-041-00	METAL CHIP	470	5%	1/10W (E230CP/E285/E295/E430/E530)

Ref. No.	Part No.	Description			Remark
R571	1-216-041-00	METAL CHIP	470	5%	1/10W
		(E230CP/E285/E295/E430/E530)			
R572	1-216-041-00	METAL CHIP	470	5%	1/10W
		(E230CP/E285/E295/E430: B, CP, VC/E530)			
R574	1-216-097-91	RES, CHIP	100K	5%	1/10W
		(E230CP/E285/E295/E430: B, CP, VC/E530)			
R580	1-216-073-00	METAL CHIP	10K	5%	1/10W
		(E230CP/E285/E295/E430: B, CP, VC/E530)			
R581	1-216-077-00	METAL CHIP	15K	5%	1/10W
		(E230CP/E285/E295/E430: B, CP, VC/E530)			
R582	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
		(E230CP/E285/E295/E430: B, CP, VC/E530)			
R583	1-216-097-91	RES, CHIP	100K	5%	1/10W
		(E230CP/E285/E295/E430: B, CP, VC/E530)			
R584	1-216-097-91	RES, CHIP	100K	5%	1/10W
		(E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)			
R585	1-216-097-91	RES, CHIP	100K	5%	1/10W
		(E230CP/E285/E295/E430: B, CP, VC/E530)			
R586	1-249-441-11	CARBON	100K	5%	1/4W
		(E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)			
R587	1-249-441-11	CARBON	100K	5%	1/4W
		(E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)			
R588	1-216-073-00	METAL CHIP	10K	5%	1/10W
		(E230CP/E285/E295/E430: B, CP, VC/E530)			
R589	1-216-073-00	METAL CHIP	10K	5%	1/10W
		(E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)			
R590	1-216-073-00	METAL CHIP	10K	5%	1/10W
		(E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)			
R600	1-249-417-11	CARBON	1K	5%	1/4W F
R601	1-216-452-11	METAL OXIDE	180	5%	2W F
R602	1-249-417-11	CARBON	1K	5%	1/4W F
R603	1-216-089-91	RES, CHIP	47K	5%	1/10W
		(EXCEPT E180EE/E380EE/E480EE)			
R604	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
		(EXCEPT E180EE/E380EE/E480EE)			
R605	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R606	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R607	1-216-089-91	RES, CHIP	47K	5%	1/10W
R608	1-249-414-11	CARBON	560	5%	1/4W F
R609	1-247-815-91	CARBON	220	5%	1/4W
R610	1-247-815-91	CARBON	220	5%	1/4W
R611	1-215-908-00	METAL OXIDE	33	5%	3W F
R612	1-215-857-11	METAL OXIDE	10	5%	1W F
R613	1-216-065-91	RES, CHIP	4.7K	5%	1/10W
R614	1-216-065-91	RES, CHIP	4.7K	5%	1/10W
R660	1-216-049-91	RES, CHIP	1K	5%	1/10W
R661	1-216-295-91	SHORT	0		
R662	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R663	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R664	1-216-049-91	RES, CHIP	1K	5%	1/10W
		(E130/E177/E180/E230: AE, EY, UY, VP1, VP2/ E295UX/E380/E430: AE, VP/E477/E480/E530UX)			
R664	1-216-041-00	METAL CHIP	470	5%	1/10W
		(E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)			

Ref. No.	Part No.	Description			Remark
R665	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R666	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R669	1-216-049-91	RES, CHIP	1K	5%	1/10W
		(E177/E180/E285B/E380/ E430B/E477/E480/E530B)			
R670	1-216-041-00	METAL CHIP	470	5%	1/10W
R671	1-216-041-00	METAL CHIP	470	5%	1/10W
R672	1-216-089-91	RES, CHIP	47K	5%	1/10W
R673	1-216-089-91	RES, CHIP	47K	5%	1/10W
R674	1-216-081-00	METAL CHIP	22K	5%	1/10W
R675	1-216-113-00	METAL CHIP	470K	5%	1/10W
R677	1-216-295-91	SHORT	0		
		(E130/E177/E180/E230: AE, EY, UY, VP1, VP2/ E295UX/E380/E430: AE, VP/E477/E480/E530UX)			
R677	1-216-041-00	METAL CHIP	470	5%	1/10W
		(E230CP/E285/E295: CP, VC1, VC2/ E430: B, CP, VC/E530B, CP, VC)			
R702	1-216-295-91	SHORT	0		
R711	1-212-893-00	FUSIBLE	330	5%	1/4W F
R713	1-216-025-91	RES, CHIP	100	5%	1/10W
R714	1-216-113-00	METAL CHIP	470K	5%	1/10W
R715	1-216-049-91	RES, CHIP	1K	5%	1/10W
R716	1-216-049-91	RES, CHIP	1K	5%	1/10W
R717	1-216-037-00	METAL CHIP	330	5%	1/10W
R731	1-216-041-00	METAL CHIP	470	5%	1/10W
		(E285B/E430B/E530B)			
R733	1-216-041-00	METAL CHIP	470	5%	1/10W
		(E177/E180/E285B/E380/ E430B/E477/E480/E530B)			
R750	1-249-417-11	CARBON	1K	5%	1/4W F
R752	1-216-049-91	RES, CHIP	1K	5%	1/10W
R753	1-216-081-00	METAL CHIP	22K	5%	1/10W
R754	1-216-025-91	RES, CHIP	100	5%	1/10W
R755	1-216-025-91	RES, CHIP	100	5%	1/10W
R756	1-216-073-00	METAL CHIP	10K	5%	1/10W
		(EXCEPT E180EE/E380EE/E480EE)			
R757	1-216-049-91	RES, CHIP	1K	5%	1/10W
		(EXCEPT E180EE/E380EE/E480EE)			
R850	1-247-807-31	CARBON	100	5%	1/4W
		(E230: VP1, VP2/E285/E295: UX, VC1, VC2/ E430: B, VC, VP/E530: B, UX, VC)			
R851	1-216-079-00	METAL CHIP	18K	5%	1/10W
		(E230: VP1, VP2/E285/E295: UX, VC1, VC2/ E430: B, VC, VP/E530: B, UX, VC)			
R852	1-216-083-00	METAL CHIP	27K	5%	1/10W
		(E230: VP1, VP2/E285/E295: UX, VC1, VC2/ E430: B, VC, VP/E530: B, UX, VC)			
R853	1-216-049-91	RES, CHIP	1K	5%	1/10W
		(E230: VP1, VP2/E285/E295: UX, VC1, VC2/ E430: B, VC, VP/E530: B, UX, VC)			
R856	1-216-097-91	RES, CHIP	100K	5%	1/10W
		(E230: VP1, VP2/E285/E295: UX, VC1, VC2/ E430: B, VC, VP/E530: B, UX, VC)			
R857	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
		(E230: VP1, VP2/E285/E295: UX, VC1, VC2/ E430: B, VC, VP/E530: B, UX, VC)			
R858	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
		(E230: VP1, VP2/E285/E295: UX, VC1, VC2/ E430: B, VC, VP/E530: B, UX, VC)			

Ref. No.	Part No.	Description	Remark
R859	1-216-123-11	METAL CHIP 1.2M 5% 1/10W (E230: VP1, VP2/E285/E295: UX, VC1, VC2/ E430: B, VC, VP/E530: B, UX, VC)	
R860	1-216-123-11	METAL CHIP 1.2M 5% 1/10W (E230: VP1, VP2/E285/E295: UX, VC1, VC2/ E430: B, VC, VP/E530: B, UX, VC)	
R861	1-216-117-00	METAL CHIP 680K 5% 1/10W (E230: VP1, VP2/E285/E295: UX, VC1, VC2/ E430: B, VC, VP/E530: B, UX, VC)	
R862	1-216-057-00	METAL CHIP 2.2K 5% 1/10W (E230: VP1, VP2/E285/E295: UX, VC1, VC2/ E430: B, VC, VP/E530: B, UX, VC)	
R968	1-247-883-91	METAL CHIP 150K 5% 1/10W	(E285B/E430B/E530B)
R969	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	(E285B/E430B/E530B)
R970	1-216-085-00	METAL CHIP 33K 5% 1/10W	(E285B/E430B/E530B)
R971	1-216-085-00	METAL CHIP 33K 5% 1/10W	(E285B/E430B/E530B)
R973	1-216-081-00	METAL CHIP 22K 5% 1/10W	(E285B/E430B/E530B)
R974	1-216-081-00	METAL CHIP 22K 5% 1/10W	(E285B/E430B/E530B)
R975	1-216-295-91	SHORT 0 (E285B/E430B/E530B)	
R976	1-216-059-00	METAL CHIP 2.7K 5% 1/10W	(E285B/E430B/E530B)
R977	1-216-089-91	RES, CHIP 47K 5% 1/10W	(E285B/E430B/E530B)
R978	1-216-071-00	METAL CHIP 8.2K 5% 1/10W	(E285B/E430B/E530B)
R979	1-216-073-00	METAL CHIP 10K 5% 1/10W	(E285B/E430B/E530B)
R980	1-216-097-91	RES, CHIP 100K 5% 1/10W	(E285B/E430B/E530B)
R981	1-216-083-00	METAL CHIP 27K 5% 1/10W	(E285B/E430B/E530B)
R982	1-216-089-91	RES, CHIP 47K 5% 1/10W	(E285B/E430B/E530B)
R983	1-216-065-91	RES, CHIP 4.7K 5% 1/10W	(E285B/E430B/E530B)
R985	1-216-041-00	METAL CHIP 470 5% 1/10W	(E285B/E430B/E530B)
R986	1-216-089-91	RES, CHIP 47K 5% 1/10W	(E285B/E430B/E530B)
R988	1-216-083-00	METAL CHIP 27K 5% 1/10W	(E285B/E430B/E530B)
R989	1-216-049-91	RES, CHIP 1K 5% 1/10W	(E285B/E430B/E530B)
R990	1-216-295-91	SHORT 0 (E285B/E430B/E530B)	
R993	1-216-071-00	METAL CHIP 8.2K 5% 1/10W	(E285B/E430B/E530B)
R994	1-216-689-11	METAL CHIP 39K 0.5% 1/10W	(E285B/E430B/E530B)
R995	1-216-073-00	METAL CHIP 10K 5% 1/10W	(E285B/E430B/E530B)
R996	1-216-689-11	METAL CHIP 39K 0.5% 1/10W	(E285B/E430B/E530B)
R997	1-216-073-00	METAL CHIP 10K 5% 1/10W	(E285B/E430B/E530B)
R998	1-216-073-00	METAL CHIP 10K 5% 1/10W	(E285B/E430B/E530B)
R999	1-216-295-91	SHORT 0 (E285B/E430B/E530B)	
		< SWITCH >	
S100	1-771-155-11	SWITCH, ROTARY (CAM ENCODER)	
S101	1-762-108-11	SWITCH, PUSH (1 KEY) (REC PRF)	
S160	1-571-588-31	SWITCH, SLIDE (NTSC PB) (EXCEPT E130/E230)	
S401	1-571-532-32	SWITCH, TACTIL (ON/STANDBY)	
S402	1-571-532-32	SWITCH, TACTIL (EJECT)	
S403	1-571-532-32	SWITCH, TACTIL (REC)	
S404	1-571-532-32	SWITCH, TACTIL (PAUSE)	
S405	1-571-532-32	SWITCH, TACTIL (PROGRAM+)	
S406	1-571-532-32	SWITCH, TACTIL (PROGRAM–)	
S407	1-571-532-32	SWITCH, TACTIL (RF CHANNEL)	
		< TRANSFORMER >	
T321	1-431-097-11	TRANSFORMER, BIAS OSCILLATION	
		< TUNER >	
TU700	1-693-404-11	TUNER, MOD/IF (BTF-3MC403) (E130/E230: AE, CP, VP1, VP2/ E285VC/E295: CP, VC1, VC2/ E430: AE, CP, VC, VP/E530: CP, VC)	
TU700	1-693-403-11	TUNER, MOD/IF (BTF-3MC444) (E285B/E430B/E530B)	
TU700	1-693-360-12	TUNER, MOD/IF SOLID TYPE (E177/E180EG/E380EG/E477/E480EG)	
TU700	1-693-359-12	TUNER, MOD/IF SOLID TYPE (E180EE/E380EE/E480EE)	
TU700	1-693-402-11	TUNER, MOD/IF (BTF-3MU603) (E230UY/E295UX/E530UX)	
TU700	1-693-401-11	TUNER, MOD/IF (BTF-3MC433) (230EY)	
		< VIBRATOR >	
X161	1-760-494-11	VIBRATOR, CRYSTAL (16MHz)	
X162	1-579-463-11	VIBRATOR, CRYSTAL (32.768kHz)	
X201	1-579-608-11	VIBRATOR, CRYSTAL (4.43MHz)	
X660	1-577-289-11	VIBRATOR, CRYSTAL (17.734475MHz)	
		MISCELLANEOUS	
		**********	
6	1-762-844-21	SWITCH, ROTARY (E380/E530)	
⚠55	1-777-854-21	CORD, POWER	
704	1-500-144-11	HEAD, FE	
769	1-759-183-11	DRUM ASSY, DZH-78A-R (E130/E177/E180/E230: AE, CP, VP2/ E285: B/E380)	
769	1-759-522-11	DRUM ASSY, DZH-93A-R (E430/E477/E480/E530)	
769	1-759-523-11	DRUM ASSY, DZH-92A-R (E230: EY, UY, VP1/E285: VC/E295)	
M902	1-698-971-11	MOTOR, DC (CAPSTAN)	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
M903	X-3947-577-1	MOTOR ASSY, CAM	
		**********	
		HARDWARE LIST	
		**********	
#1	7-685-648-79	SCREW +BVTP 3X12 TYPE2	
#2	7-682-547-04	SCREW +P 3X6	
#3	7-685-646-79	SCREW (3X8)	
#4	7-685-133-19	SCREW (DIA. 2.6) (IT3B)	
		ACCESSORIES & PACKING MATERIALS	
		**********	
	1-475-565-11	COMMANDER, STANDARD (RMT-V220)	(E130/E177/E180/E380: EE)
	1-475-565-31	COMMANDER, STANDARD (RMT-V220B)	(E480: EE)
	1-475-566-11	COMMANDER, STANDARD (RMT-V221)	(E230: AE, CP, VP1, VP2/E285: VC/E380: EG)
	1-475-566-21	COMMANDER, STANDARD (RMT-V221A)	(E230: EY, UY)
	1-475-566-31	COMMANDER, STANDARD (RMT-V221B)	(E285: B)
	1-475-566-41	COMMANDER, STANDARD (RMT-V221C)	(E430: B)
	1-475-566-51	COMMANDER, STANDARD (RMT-V221D)	(E477)
	1-475-566-61	COMMANDER, STANDARD (RMT-V221E)	(E430: AE, CP, VC, VP/E480: EG)
	1-475-567-11	COMMANDER, STANDARD (RMT-V222)	(E295: CP, VC1, VC2/E530: CP, VC)
	1-475-567-21	COMMANDER, STANDARD (RMT-V222A)	(E295: UX/E530: UX)
	1-475-567-31	COMMANDER, STANDARD (RMT-V222B)	(E530: B)
	1-696-593-11	CORD, CONNECTION (PAL) (ANT) 1.5m	
⚠	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P	(E230: EY, UY/E295: UX/E530: UX)
	3-709-128-01	COVER, BATTERY (for EXCEPT RMT-V220 /V220B) (E230/E285/E295/E380: EG/E430 /E477/E480: EG/E530)	
	3-709-322-01	COVER, BATTERY (for RMT-V220/V220B)	(E130/E177/E180/E380: EE/E480: EE)
	3-861-449-11	MANUAL, INSTRUCTION (ENGLISH)	(E295: UX/E530: UX)
	3-861-449-21	MANUAL, INSTRUCTION (FRENCH)	(E295: VC1/E530: VC)
	3-861-449-32	MANUAL, INSTRUCTION (FRENCH) (E530: B)	
	3-861-449-41	MANUAL, INSTRUCTION (SPANISH)	(E295: CP/E530: CP)
	3-861-449-51	MANUAL, INSTRUCTION (GERMAN)	(E295: VC1/E530: VC)
	3-861-449-61	MANUAL, INSTRUCTION (ITALIAN)	(E295: CP, VC1/E530: CP, VC)
	3-861-449-71	MANUAL, INSTRUCTION (DUTCH)	(E295: VC1/E530: VC)
	3-861-449-81	MANUAL, INSTRUCTION (PORTUGUESE)	(E295: VC2)
	3-861-451-11	MANUAL, INSTRUCTION (SWEDISH)	(E295: VC2)
	3-861-451-21	MANUAL, INSTRUCTION (DANISH) (E295: VC2)	
	3-861-451-31	MANUAL, INSTRUCTION (FINNISH) (E295: VC2)	
	3-861-451-41	MANUAL, INSTRUCTION (GREEK)	(E295: CP/E530: CP)
	3-861-452-11	MANUAL, INSTRUCTION (ENGLISH)	(E230: EY, UY)
	3-861-452-21	MANUAL, INSTRUCTION (FRENCH)	(E230: VP1/E285: VC/E430: VP)
	3-861-452-32	MANUAL, INSTRUCTION (FRENCH)	(E285: B/E430: B)
	3-861-452-41	MANUAL, INSTRUCTION (SPANISH)	(E230: CP/E430: CP)
	3-861-452-51	MANUAL, INSTRUCTION (GERMAN)	(E230: VP1/E285: VC/E430: VC, VP)
	3-861-452-61	MANUAL, INSTRUCTION (ITALIAN)	(E230: VP1/E285: VC/E430: AE, VP)
	3-861-452-71	MANUAL, INSTRUCTION (DUTCH)	(E230: VP1/E285: VC/E430: VP)
	3-861-452-82	MANUAL, INSTRUCTION (PORTUGUESE)	(E430: VC)
	3-861-453-11	MANUAL, INSTRUCTION (SWEDISH)	(E230: VP2)
	3-861-453-21	MANUAL, INSTRUCTION (DANISH) (E230: VP2)	
	3-861-453-31	MANUAL, INSTRUCTION (FINNISH) (E230: VP2)	
	3-861-453-42	MANUAL, INSTRUCTION (GREEK) (E430: AE)	
	3-861-454-11	MANUAL, INSTRUCTION (SWEDISH)	(E130: AE2)
	3-861-454-21	MANUAL, INSTRUCTION (DANISH) (E130: AE2)	
	3-861-454-31	MANUAL, INSTRUCTION (FINNISH) (E130: AE2)	
	3-861-454-41	MANUAL, INSTRUCTION (GREEK) (E130: AE1)	
	3-861-455-12	MANUAL, INSTRUCTION (ENGLISH)	(E380: EG/E477/E480: EG)
	3-861-455-22	MANUAL, INSTRUCTION (CZECH)	(E380: EG/E477/E480: EG)
	3-861-455-32	MANUAL, INSTRUCTION (POLISH)	(E380: EG/E477/E480: EG)
	3-861-455-42	MANUAL, INSTRUCTION (HUNGARIAN)	(E380: EG/E477/E480: EG)
	3-861-456-12	MANUAL, INSTRUCTION (ENGLISH)	(E177/E180: EG)
	3-861-456-22	MANUAL, INSTRUCTION (CZECH)	(E177/E180: EG)
	3-861-456-32	MANUAL, INSTRUCTION (POLISH)	(E177/E180: EG)
	3-861-456-42	MANUAL, INSTRUCTION (HUNGARIAN)	(E177/E180: EG)
	3-861-457-12	MANUAL, INSTRUCTION (ENGLISH)	(E180: EE/E380: EE/E480: EE)
	3-861-457-22	MANUAL, INSTRUCTION (RUSSIAN)	(E180: EE/E380: EE/E480: EE)
	3-861-462-11	MANUAL, INSTRUCTION (FRENCH) (E130: AE1)	
	3-861-462-21	MANUAL, INSTRUCTION (SPANISH)	(E130: AE2)
	3-861-462-31	MANUAL, INSTRUCTION (GERMAN)	(E130: AE1)
	3-861-462-41	MANUAL, INSTRUCTION (ITALIAN) (E130: AE1)	
	3-861-462-51	MANUAL, INSTRUCTION (DUTCH) (E130: AE1)	
	3-861-462-61	MANUAL, INSTRUCTION (PORTUGUESE)	(E130: AE2)
*	3-979-509-01	INDIVIDUAL CARTON (E530: CP, VC)	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
*	3-979-509-11	INDIVIDUAL CARTON (E530: UX)	
*	3-979-509-21	INDIVIDUAL CARTON (E530: B)	
*	3-979-509-31	INDIVIDUAL CARTON (E430: AE, CP, VC, VP)	
*	3-979-509-41	INDIVIDUAL CARTON (E430: B)	
*	3-979-509-51	INDIVIDUAL CARTON (E295: UX)	
*	3-979-509-61	INDIVIDUAL CARTON (E295: CP, VC1, VC2)	
*	3-979-510-01	CUSHION	
*	3-979-511-01	SPACER	
*	3-987-571-11	INDIVIDUAL CARTON (E230: EY, UY)	
*	3-987-571-21	INDIVIDUAL CARTON (E130)	
*	3-987-571-31	INDIVIDUAL CARTON (E285: VC)	
*	3-987-571-41	INDIVIDUAL CARTON (E285: B)	
*	3-987-572-01	INDIVIDUAL CARTON (E480: EG)	
*	3-987-572-11	INDIVIDUAL CARTON (E480: EE)	
*	3-987-572-21	INDIVIDUAL CARTON (E477)	
*	3-987-572-31	INDIVIDUAL CARTON (E380: EG)	
*	3-987-572-41	INDIVIDUAL CARTON (E380: EE)	
*	3-987-572-51	INDIVIDUAL CARTON (E180: EG)	
*	3-987-572-61	INDIVIDUAL CARTON (E180: EE)	
*	3-987-572-71	INDIVIDUAL CARTON (E177)	

9-921-675-11

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